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ABSTRACT

A study was conducted to determine the process by which recent high school graduates enter the labor market, seek and find jobs, migrate from one type of location to another, and the extent to which they are able to further their career objectives via job and location mobility. In addition, the role of the education system in the school-to-work transition was examined. Data for the study were drawn from the National Longitudinal Study of the High School Class of 1972, integrated with 1970 Census data. Results inferred from this data include the following: (1) the probability of migration is positively influenced by knowledge of labor market factors, lower socioeconomic background, fewer number of years in residence at high school location, verbal and mathematical aptitude, and marriage for females; (2) migration is not affected by race, sex, or rural residence; (3) migration enhances the employment prospects for persons initially without jobs, especially students; (4) postsecondary education favorably influences employment changes and wages; (5) the graduates used mostly informal methods to seek employment, such as friends and direct application to firms; however, using employment agencies, school placement agencies and union registration is more likely to result in finding a job. The study implies that geographic mobility can be viewed as a productive undertaking for promoting upward mobility once a young person has successfully entered the labor force and gained employment. (KC)

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An Analysis of Youth Job Search and Geographic Mobility

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June 1980

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CHAPTER I

SUMMARY AND IMPLICATIONS

A. INTRODUCTION

Graduation from high school for noncollege-bound individuals marks the transition from a style of life dominated by school activity to one that is predominantly work oriented. This transition, along with the changing needs and desires associated with finding employment and forming new households, sets into motion a variety of socioeconomic adjustments either in anticipation of or in response to entering the labor force. This research project concentrates on a particular facet of the school-to-work process that deals explicitly with the mechanism whereby young workers and employers are brought together via the job search and migration decisions of new labor force entrants. Job and location adjustments are referred to generally in this report as mobility, although the analysis is clear in distinguishing among its various components.

The importance of examining youth job and location mobility is underscored by the numerous obstacles encountered by recent graduates as they enter the labor force. Two of the most critical factors hindering the quick and successful matching of workers and jobs are the absence of job information and the various barriers to labor mobility. Given these problems, job search and geographic mobility are worthwhile activities, where labor market activity can be viewed as a chain of causation running from the acquisition of information on jobs and locations, to employment and geographic mobility, to certain patterns of resource allocation implied by the matching of firms and workers.

Within this framework, search and job location mobility are productive activities undertaken by individuals at a cost to generate information on jobs and locations, which yield a return in the form of pecuniary and nonpecuniary benefits. Superimposed on this general phenomenon is (1) the high frequency of job and geographic mobility of the young relative to older population subgroups, (2) the importance of an individual's initial labor force experiences in shaping the pattern of future successes in the labor market, and (3) the pivotal role of young a persons' educational preparation prior to entering the workforce. Schooling has been found to be a significant determinant of individual productive skills which are necessarily linked to subsequent labor market rewards. More recently, education has been found to affect the ability of workers to acquire and assess relevant information in their efforts to locate better employment opportunities.

There are two overall goals that govern the design of the conceptual and empirical analysis. First, an understanding must be achieved of the process by which recent high school graduates enter the labor market, seek and find jobs, migrate from one type of location to another, and the extent to which they are able to further their career objectives via job and location mobility. Insight into this complex phenomenon is essential if policy-makers are to reduce the incidence of youth employment and to increase the quality of employment. A second major goal is to gain insight into the role of the education system in the school-to-work transition. There is a critical need to ascertain exactly what it is about the education system, individual ability, motivation, and the student's interaction with school personnel and resources that facilitate or inhibit the smooth and successful transition into employment.

In particular, the research examines three related aspects of the mechanism by which recent high school graduates achieve success in the labor market:

(1) Analysis of the determinants of geographic mobility;

(2) Analysis of the impact of migration on the probability of employment and wage growth;

(3) Analysis of what search methods are used to find jobs, their respective job-finding effectiveness, and their respective impacts on wage growth.

The importance of analyzing the impact of the education system on the determinants and implications of search and migration cannot be overstressed. Heretofore, researchers have been generally confined to years of formal education attained and measures of labor force experience in their analyses of mobility. While both factors have been found to be significant variables, analysts have recognized that the quality of the education experience may matter as much or more than the quantity of accumulated experience. This is particularly important for youth entering the labor market whose job experience is negligible compared to older workers. Moreover, the early years in the work force are critical determinants of subsequent labor market outcomes. Clearly, if policy makers are to reduce the incidence and duration of unemployment among youth and to increase their employment potential, efforts must be made by educators to identify, enlarge, and/or alter the mix of educational services offered to the young in order to enhance the transition from school to work.

The research described in this report is part of an ongoing set of studies funded by the National Center for Education Statistics (NCES). Our empirical analysis uses the National Longitudinal Study of the High School Class of 1972. This NCES data set encompasses roughly a four and one-half year period (spring 1972 to fall 1976) and the information contained is based on four successive surveys of a cohort of over 21,000 high school graduates (high school administrative data were also collected).

One of the unique features of this study is that the NCES data permit analyses of the behavior of certain population subgroups that have not been possible with existing data sets. In particular, the large panel consisting of a single age group enables us to focus on young persons, to distinguish between married and single persons, and to test for statistical differences across race-sex characteristics. The fact that the cohort is just entering the economic mainstream also provides an excellent opportunity to investigate the role of background and schooling factors in influencing the short-term successes of young labor entrants. In addition, merging local labor market measures from the 1970 Census with the NCES data enables us to test the responsiveness of young graduates to prevailing economic opportunties. Previous migration studies either have used aggregate data on population flows or have used micro longitudinal data with respect to white, intact, married households. The NCES data thus provide a good base with which to fill some important gaps in the migration literature.

To accomplish the ambitious task described above, it is essential (1) to understand the general policy context regarding youth employment and educational goals; (2) to be aware of previous analyses of migration and job search behavior in order to build on the extant body of knowledge as well as fill existing gaps; and (3) to develop a clear notion of the general search-migration context and the role of education within it. Toward these ends, a general background of youth employment problems and education policy issues are described in chapter III, and the current state of the literature is reviewed in chapter III which summarizes what is currently known about the determinants and implications of migration and job search activity. In chapter IV, a theoretical model of job-location mobility is formulated which provides the conceptual foundation for specifying the empirical models and for interpreting the estimated coefficients.

In chapter V, a probability model of migration is used to estimate the determinants of long-distance moves (greater than 100 miles) that are undertaken in either the first two years following high school (1972-74) and/or the second two years after graduation (1974-76). In chapter VI, the implications of job and geographic location mobility, as well as the impacts of other explanatory variables, are analyzed in terms of (1) the probability of being employed in October 1976 and (2) the two-year percentage change in wage rates that occurred between October 1974 and October 1976. In chapter VII, job search methods used by young workers are examined both in terms of the frequency of use and by the extent to which methods used were more or less likely to lead to employment. The effect of search methods on the percentage change in wage rates (1974-76) are also estimated.

In the remainder of this chapter, the sources of data used in the empirical analyses are described; the major empirical results are summarized; and in the last section, a number of conclusions and policy implications are noted.

B. DESCRIPTION OF THE DATA

1. The National Longitudinal Study of the High School Class of 1972

The primary data file utilized in this study is the National Longitudinal Study of the High School Class of 1972, sponsored by the National Center for Education Statistics (NCES). This large-scale, long-term survey contains extensive information about the educational and vocational activities, plans, aspirations, and attitudes of young people after they leave high school, as well as data pertaining to the prior educational experiences, personal, and biographical characteristics of these people.

The sample design for the NCES survey originally called for the selection of 1,200 schools around the country, from each of which 18 seniors were to be interviewed, school size permitting. The school sampling frame was broken down into 600 strata based upon the following variables: type of control (public or nonpublic), geographic region (Northeast, North Central, South, and West), grade 12 enrollment (less than 300, 300 to 599, 600 or more), proximity to institutions of higher learning, percentage minority group enrollment, income level of the community, and degree of urbanization. For each final stratum, four schools were to be chosen--two of which were to emerge as primary selections, the others as backup or substitute selections. In addition to the 18 students per school chosen, five additional students would be selected as alternates.

At present, the ongoing NCES survey is composed of four distinct interviews encompassing the period 1972-1976. The base year survey took place in the Spring of 1972, and included several data collection forms. A Student Questionnaire dealt with factors relating to family, background, education and work experiences, plans, aspirations, attitudes and opinions. A Test Book, consisting of six tests, measured both verbal and nonverbal ability. A Student's School Record Information Form, recorded the student's high school curriculum, grade point average, credit hours in major courses, and if applicable, his or her position in ability groupings, remedial instruction method, involvement in certain federally supported programs and scores of standardized tests. Lastly, school and counseling data were gathered for each school by use of a School Questionnaire and one or two Counselor Questionnaires. In all 1,009 schools actually ended up participating, resulting in a student sample of 19,144, with varying response for each of the data collection forms. The key form, the Student Questionnaire, was completed by 16,683 seniors.

The first follow-up survey, conducted from October 1973 to April 1974, involved the use of two forms designed for self-administration by the student. Form A was mailed to each sample member who completed the base year Student Questionnaire, while Form B was mailed to seniors from the high school class of 1972 who were unable to participate in the base year survey. Aside from the presence in Form B of an additional 14 questions to supplement missing base-year information, the two forms were identical. Survey questions dealt with information concerning the respondent's activity state (education, work, military service, etc.) in October 1972 and October 1973; his or her socioeconomic status; work and educational experiences since leaving high school; and future educational and career plans, aspirations, and expectations. A total of 21,350 persons completed the First Follow-up Questionnaire, including 15,635 of those who responded to the base-year Student Questionnaire--a sample retention rate of 93.7 percent.

The second follow-up survey began in October 1974 and was completed in April 1975. The questionnaire used was similar in nature to the one utilized in the first follow-up, including information about the activity status of NLS sample members as of Fall 1974, family status, personal attitudes, opinions, and plans. Some 20,872 sample members completed the Second Follow-up Questionnaire, including 20,194 of the 21,350 who completed the First Follow-up Questionnaire - a 94.6 percent sample retention rate.

The last of the follow-ups to date was the third follow-up survey, begun in October 1976 and completed in May 1977. In addition to repeating basic questions included on past questionnaires, this questionnaire served to collect information on activity states for October 1975 and October 1976, graduate school application and entry, job supervision, sex-role orientation, sex and race biases, and a subjective rating of high school experiences. Among the 20,092 sample members who completed the Third Follow-up Questionnaire were 93.9 percent who completed the Second Follow-up Questionnaire. The retention rate of those sample members who completed all three follow-up questionnaires was 94.7 percent.

2. 1970 Census Data

An important deficiency of the NCES data base is the absence of information pertaining to local labor market conditions. Previous studies of migration behavior have determined that varying labor market conditions in different geographic areas may exert an important influence over the decision to migrate as well as the chosen destination of migration. In particular, a study focusing upon migration and job search is in special need of data pertaining to local and/or broader economic conditions.

It is well known that labor market conditions vary according to race, sex, age, education and location status. They also, of course, change to some degree over time. An ideal source of data would therefore be one which provides different measures of job opportunities for subgroups distinguished by these status variables over time. This would make possible a far more accurate assessment of the impact of labor market conditions on job and geographic mobility of working youths than could be obtained by using aggregate labor market data averaged across all groups. Among available sources, however, there exists a tradeoff between time series labor market data disaggregated by large SMSAs only, and point-in-time data disaggregated by key status variables, including 3-digit zip code location. Because the use of time series data would result in the exclusion of large part of the NLS sample, i.e., those persons not residing in large SMSAs, the decision was made to use the more geographically specific point-in-time data. These data were obtained from the 1970 Census of Population and Housing, Fifth Count Summary Tape, aggregated by 3-digit zip code areas, within which, labor force status measures were disaggregated by age, race, sex, education and enrollment status.

This decision reflects the assumption that the most basic and important differences across geograhically dispersed labor markets tend to remain constant over time. While we recognize that these structural differences will change, we believe that the basic pattern will persist over a period of several years, enough to overlap at least a portion of period encompassed by the NCES surveys. It should be noted that the national economy, in terms of quarterly unemployment rates, did not differ substantially over the 1970 to 1974 period. However, by 1975, the economy deteriorated considerably, which suggest that the use of 1970 Census data may not be appropriate for our analysis based on the last two years covered by the NCES panel data.

C. SUMMARY OF THE EMPIRICAL RESULTS

Migration is an important phenomenon, both for the socioeconomic well-being of individual households and also for society at large. Presumably, households move in order to improve their financial and/or non-financial status, thereby improving the overall functioning of the economy as individuals move to areas making better use of their productive talents. The extent to which workers recognize and respond to market signals has stimulated considerable inquiry among social scientists and policy-makers. As noted in the literature review in chapter III, recent research unfortunately has not focused on the geographic mobility of youth, inspite of the fact that young persons have the highest rates of job and location mobility in the U.S. population.

Superimposed on the high mobility of youth and the general lack of knowledge concerning it, is the school-to-work transition that is so critical for today's youth. Research has focused primarily on the insufficient quality/quantity of formal schooling, the lack of skills directly applicable to work, disadvantaged family and neighborhood backgrounds, discrimination, poor job placement and dead-end, low-paying jobs to which young workers are often relegated. Relatively little analysis, however, has focused on the mechanisms by which young persons enter the labor market and find employment through their job search efforts and/or decisions to migrate.

If migration is an effective means for youth to secure (better) employment, then one is led to ask what factors encourage or discourage such movement. In the analysis, we attempt to answer both questions by scrutinizing both the causes and effects of youth migration. With regard to the occurence of migration analyzed in chapter V, we take advantage of the four and and one-half year period encompassed by the data and split it into two segments: (1) the spring of the sample's senior year in high school (1972) to October 1974, and (2) October 1974 to October 1976. This partitioning enables us to examine two quite different stages in a young person's post-secondary career as a young adult. With regard to the labor market outcomes of migration analyzed in chapter VI, the analysis focuses on the impact of 1972-1976 migration on the probability of employment in October 1976 and wage growth between October 1974 and October 1976. Finally, the examination of job search methods used by recent high school graduates analyzed in chapter VII, is based on yearly retrospective data gathered from the second follow-up survey; and the wage implications of using different search methods are based on an analysis of wage change that occurred between October 1974 and October 1976.

The empirical analyses are specified within a general theoretical model of job and location mobility that is formulated in chapter IV. The conceptual model is built on the premise that potential movers weight the expected increase in earnings associated with job/location mobility by the chance of obtaining such an increase, less the costs of searching and relocating. To the extent that individuals behave according to this model, we expect to find significant relationships between the likelihood of moving and the explanatory variables measuring the benefits, costs, and chances of obtaining alternative employment. In addition, we anticipate that migration motivated by labor market considerations will lead to a greater probability of post-move employment and to higher wage rates than would have transpired in its absence.

In concentrating on migration, it should be noted that there is no objective mileage standard that indicates whether or not a geographic move is a long-or short-distance move. For this study, migration is defined as a move of at least 100 miles from the point of origin. The 100-mile criterion was chosen in order to concentrate on long-distance moves, which makes sense in light of our desire to focus on the mobility of labor from one market to another. Almost all other studies have been forced to use intercounty, interstate, or interdivisional moves as a measure of migration. Many short-distance moves, however, involve a change in county and/or state (e.g., cross-metropolitan) which would qualify as migration by this criterion, whereas many long-distance moves would not.

In what follows, the most interesting results of the three empirical chapters are highlighted.

1. Probability of Migration: Summary of Results

The goal of this part of the research is to discern what prompts individuals to redistribute themselves geographically without the constraining influences of their usually short term careers as students and military personnel. Because the latter tend to move for noneconomic reasons, the analysis excludes persons classified either as students or military personnel at the beginning of the analysis period. The migration analysis for the two time periods extends the results of previous research in its focus on youth, by stratifying the sample by sex and marital status, and by including several explanatory variable that have heretofore been omitted. The primary results for the two periods are as follows.

First, desite repeated attempts to discover potential interaction effects, race does not appear to play a significant role in influencing migration, either by itself or in conjunction with other variables. There were some scattered male-female differences, but by and large, the estimates are more supportive of a neutral effect. In general, there is little in our conceptual model that would lead to widespread race-sex differences after controlling for other factors. The empirical results tend to support the idea that race-sex differences are not widespread.

Second, recent high school graduates exhibit a pronounced degree of responsiveness to labor market signals, especially as measured by the local employment-population ratio. This finding is important in demonstrating that youth are aware of market opportunities and behave accordingly. These results stand in contrast to some earlier research findings which indicate that young persons are ignorant of relevant labor market information and/or do not act in a rational fashion. While the estimates cannot tell us whether or not the behavioral responses are optimal, they do suggest that education and labor policies designed to provide more/better market information may have a positive impact because the basic behavioral response is present.

Third, the historical movement away from rural areas is not taking place during the 1972-76 period under investigation. After controlling for other factors, migration away from sparsely populated areas is no more likely than what occurs for the average sample member, although smaller cities tend to lose young people and larger metropolitan areas tend to retain young people.

Fourth, the socioeconomic background of graduates has a positive influence on migration that persists over the four years following high school. Just as family SES seems to influence other forms of behavior as educational and labor market attainment, so the home environment represented by the SES variable also imparts a lasting influence via the likehood of moving.

Fifth, the number of years in residence at the 1972 high school location exerts a strong impact on the probability of migration. This empirical finding provides an intriguing link between past geographic mobility as a dependent family member and future mobility as an independent household unit. This result represents the first time that the hypothesized tie between childhood migration and subsequent movement as a young adult has been demonstrated empirically. The relationship indicates that mobility, to a certain extent, represents an acquired predisposition due possibly to increased knowledge and decreased psychological inhibitions to moving away from a known environment. A second and equally relevant explanation for this impact is that location-specific assets (friends, knowledge of local job vacancies) are related to the length of time that someone has resided in a single location.

Sixth, and similar to the above, a recent move (between June 1972 and October 1974) is strongly correlated with a future move (between October 1974 and October 1976). Part of this tie may be explained by an unobserved mobility preference, and part may be due to place-specific investments in information and friends that are undoubtedly related to years in residence. The smaller are the place-specific assets, the lower the costs of moving.

Seventh, the high school experience has an influential role in stimulating migration which, however, apears to diminish over time. Both the social and institutional environment of the high school, when taken as a whole, suggest that access to job-location information is a significant determinant of geographic mobility. The college attendance of former students, staff-student ratios, and participation in special educational programs provide a consistent pattern of evidence that the school environment is influential and can be altered so as to encourage or discourage migration.

Eighth, there are significant differences between single and married respondents. For males, marriage inhibits mobility, while for females, the opposite is found. The former relationship is consistent with a priori expectations in that husband-wife families are likely to be more socially and economically integrated into the local area, thus increasing the opportunity costs of a contemplated move. The latter association might be explained by the tendency of single females to stay close to relatives for socioeconomic support and to move away with their husbands when they do marry (their husbands may have unobserved characteristics that would dictate a move).

Ninth, verbal and mathematical aptitude, as measured by several short tests in 1972, is estimated to play a significant role in explaining the occurrence of long-distance moves. This finding is consistent with the maintained hypothesis that the ability to acquire and assess job opportunities in distant locations is a critical element that underlies the likelihood of migrating.

Tenth, labor force status and employment experience during the recent past have a substantial impact on the probability of moving. Individuals without jobs, few weeks of past employment, and low wages are more likely to move than employed, higher paid workers who have strong employment ties in the origin labor market. All of these estimates reinforce the notion of economic opportunity costs and underscore the strong interrelationship between labor market and geographic mobility. The estimated importance of current job search and willingness to relocate to obtain a job contribute to the argument that job-location changes represent an important behavioral nexus that warrants further investigation by researchers.

2. Employment and Earnings Effects of Migration and Job Change: Summary of Results

This stage of the research examines two key implications of job and location mobility. The first part estimates the influence of migration on the probability of employment in October 1976. The second analysis part specifies a percentage wage change equation (October 1974 to October 1976) in order to estimate the wage impact of job and location changes on wage growth over the two-year period. According to economic theory, individuals move in order to make themselves better off. However, under conditions of imperfect information, the viability of labor mobility as an efficient allocative mechanism cannot be assumed. Hence, it is crucial to determine whether or not, and under what conditions, job and location mobility have a positive economic impact for the individuals involved.

Because our orientation is toward labor market experiences in the private sector, the study excludes from the sample persons who were in the military. For the employment analysis, the military filter is imposed as of October 1974. For the wage change analysis, the military filter is also imposed for October 1976. In addition, the wage change analysis requires persons to have been employed at both end points of the time period and not to have been full-time students at either endpoint. In what follows, the employment effects of migration are summarized first, followed by an enumeration of the wage effects of mobility, and concluding with a synopsis of the most interesting findings with regard to the other explanatory variables used in the estimation.

First, there is a substantial difference between persons whose migration decisions are linked to labor market activity and those who move for nonjob reasons (personal, school, environment). On average, the latter are significantly less likely to be employed in October 1976 than job-related movers and immobile workers. Furthermore, the lower incidence of employment among nonjob-related movers is not influenced by personal characteristics or by initial labor force status. This finding is not surprising in light of the conceptual model that was built on the hypothesis that potential movers based their decisions on a calculus of maximizing earnings. Clearly, the objective function to be maximized must be altered if we are to predict and measure the repercussions of migration that is motivated by other, nonlabor market objectives.

Second, the employment outcome of job related moves is dependent on initial (October 1974) labor force status. Among those who were initially employed, migration is estimated to result in a slight, insignificant increase in the probability of employment in October 1976 over that of similar nonmovers. Among those who were without jobs in October 1974, migration has a large, positive effect on subsequent employment. These findings suggest that jobless workers are able to raise their chances of employment through migrating to almost the same level as for the intially employed. This is a significant result because our analysis finds that a worker's employment status tends to persist over time. Hence, migration may play a key role for young workers to escape from areas where they are without work.

Third, a closer look at the positive impact of migration for those who were initially without jobs reveals a sharp difference between students and nonstudents. Students who were not working were estimated to have a much higher employment probability if they migrated than if they did not. On the other hand, migrants who were neither employed nor enrolled in school increased their chances of employment over similar nonmigrants by an insignificant margin.

Fourth, the above indicates that migration enhances the prospects of employment for persons initially without jobs, especially students. Migration, however, does not appear to increase the likelihood of employment for workers originally employed, the subset with the highest employment incidence. In the wage change analysis, the focus shifts precisely to the subgroup of initially employed workers to examine whether or not migration influences the rate of wage growth during the two-year analysis period. In general, the results indicate that migration has a significant and positive effect on wage change for workers employed at both the beginning and end of the time period. Thus, geographic mobility appears to have a positive economic effect for migrants, although the way it improves an individual's financial position varies by his or her recent employment experience.

Fifth, the finding of positive wage returns to migration (gross of costs) is estimated to hold only for persons who move for job-related reasons. Moves undertaken for non-labor market purposes have an insignificant effect on wages, although the employment analysis suggested that this group of movers were much less likely to have found jobs by October 1976.

Sixth, migration (excluding job transfers) implies a job change. Contrasting the wage experience of job switchers who did and did not migrate, resulted in a significant wage differential in favor of job and location changers than similar, but local job changers. This evidence is consistent with the hypothesis that workers set higher acceptance standards in selecting jobs in more distant markets to offset the greater associated uncertainty and relocation costs. The results also suggest that workers benefit financially from expanding the geographic scope of their job hunt because of the wider range of possible job offers.

Seventh, the pecuniary return to migration is greatest for rual-to-urban migrants. For moves undertaken during the 1974-76 period, rual-rural and urban-urban combinations of original destination also resulted in positive wage changes.

Eighth, the wage impact of job-related migration is related to a mover's socioeconomic background: the lower the family SES, the greater the wage benefits to migration. This interdependence presents an interesting, often overlooked, way in which persons from relatively disadvantaged backgrounds may enhance their financial status.

Ninth, an individual's aptitude is estimated to have a significant influence in increasing both the probability of employment as well as the percentage change in wage rates. The skills that are either innate and/or learned in high school are presumed to be important determinants of a worker's productivity, the rate at which new skills are acquired, and a person's ability to seek out new jobs in new locations. An individual's high school grades and evidence of leadership ability also play a positive role in the employment process, although they were found to be insignificant determinants of wage change. The influence of these high school related variables on young workers' labor market success, two to four years after graduation, suggests that the secondary education experience has important economic effects that remain with students as they enter and participate in the labor market.

Finally, there is preliminary evidence that the acquisition of postsecondary education (PSE), in the form of earning nonfour-year degrees or certificates, has a positive impact on both the incidence of employment and the rate of wage change. While there is theoretical justification for such a positive influence due to the increments to human capital, the private returns to public PSE programs have yet to be investigated in a systematic fashion. Our results suggest that a significant link may exist between postsecondary education and subsequent market outcomes.

3. Use and Effects of Job Search Methods: Summary of Results

The final aspect of the research examines the job search behavior of young high school graduates. In particular, the methods used to find employment are examined in two ways. The first uses data on all respondents who reported searching for one or more jobs between October 1973 and October 1974. For a number of reasons, the NCES data do not support a rigorous analysis of the determinants of using one search method versus another, or the outcomes of using a given method. Thus, we generate tabular statistics for the entire sample, as well as for race/sex subgroups in order to measure the frequency of usage and effectiveness in leading to employment among eleven search methods. The second part of the analysis examines the wage implications for successful searchers (i.e., for those who search and find employment), by using the 1974-76 wage change equation developed in the previous analysis. The primary results of these efforts are summarized below.

Young high school graduates rely most heavily on informal search methods to look for and to obtain employment. In particular, direct application to firms, and use of friends and relatives are cited most frequently by all race/sex groups in the NCES sample. While formal methods tend to be used much less than informal methods, school/college placement, private employment agencies, and union registration account for a considerably greater proportion of job matches relative to their use rates, than are other formal and informal methods. This suggests that these insitutions may play important roles as labor market intermediaries.

In contrast, direct firm contacts, and especially the use of media and public employment services have relatively lower effectiveness rates compared to their respective use rates. This may imply that direct applications and responses to advertisements provide little job requirement and worker skill information to potential employers and employees, thereby reducing the odds that any one contact will result in an acceptable offer. This seems to be particularly true for the use of media as a job search method. The lower effectiveness rate for public employment agencies may reflect either the relatively limited number/type of job vacancies listed with the agency, or the fact that laid-off workers register with the agency only as a prerequisite for receiving unemployment insurance and hence, use it only in a nominal sense.

The estimated returns to search methods used to find the October 1976 job provide some additional information. For those who obtained their jobs through the public employment service, the percentage change in wage rates was significantly lower than for workers who used other methods. Thus, the public employment service appears to be both a less effective source of jobs and, for the workers who are placed, the relative wage payoff is smaller. However, it is premature to conclude that the public employment service is not a cost-effective intermediary because it may enable job seekers to obtain employment without investing much time or money into the job hunt. Hence, the time commitment required of seeking out job vacancies, via direct employer contacts, and possibly by responding to want-ads, may offset much of the differential between these methods and the public employment service.

The only search method with a significantly positive wage effect is the use of friends. As discussed earlier, the more detailed information provided to jobseekers, and possibly the use of friends as references, contributes to a greater chance of obtaining a better paying job. This finding suggests that both workers and firms would benefit from the provision of richer, more accurate data on their counterparts.

The lack of significant variation across most search methods is somewhat surprising. Part of this is due to the insufficient number of persons in the job changer sample who reported using some of the methods (school placement, civil service, and private employment agencies). Another explanation, that is difficult to disentangle, is that jobseekers tend to use a variety of methods (the average number is four) when looking for a job. During the job hunt, however, the individual may find that because of personal skills/preferences or the characteristics of the job market, certain methods seem to be the most useful in generating information and offers. Hence, there may be a self-selection phenomenon taking place whereby searchers gradually eliminate unproductive methods and focus their time/money investments into only one or two. One could speculate that the outcome of this winnowing-out process, ceteris paribus, is that there is a general bunching of the respective wage impacts associated with the methods that are observed to result in a job find.

Our results imply that search methods seem to influence the starting rate of pay, but thereafter, other attributes of the worker, as well as the firm and local labor market, dominate in the wage growth process. Specifically, the sample stratification has enabled us to isolate what may be a major explanation of why interfirm mobility results in a short term depression in wage rates. The human capital literature makes the distinction between productive skills applicable to all jobs (general) and skills that are relavant only to a particular firm (specific). If employers pay their workers according to their general skills, and in addition pay them a portion of their firm-specific human capital in order to reduce voluntary turnover, then switching jobs should result in a wage reduction until firm specific skills are acquired on the new job.

In this context, our results indicate that a worker's value to a firm is not only a function of on-the-job experience, but is also dependent on other characteristics such as aptitude and postsecondary education. These attributes affect both the level and rate of skill development, which in turn is presumably reflected in wage change. If, however, this process requires employer recognition, then we would expect this relationship to be most pronounced for stable workers - a result that is corroborated by our results. However, the limited time frame of the NCES data do not permit generalizing these findings to the general population. It is possible that over time, educational attainment and aptitude may play a smaller role in determining labor market successes, and interim work experience may play a more influential role.

In sum, the search method analysis should be considered exploratory. It has provided useful information on the primary channels of employment and has identified two methods that seem to have relatively large or small wage payoffs. However, the analysis is limited by its narrow examination of the job search process, and therefore, raises as many questions as it answers. For example, to evaluate the returns to various search methods requires data on the time and money invested per method, and how frequently a method were used. Nor do we have sufficient information to discern systematic patterns of usage among methods, if any exist. Finally, the employment and wage implications of search are governed in part by the nature of a recent job separation and in part by prevailing labor market conditions, neither of which are available in the data.

D. IMPLICATIONS

This research project has produced a number of interesting insights into the determinants and implications of youth migration of job search. When juxtaposed against the general set of policy issues discussed in section B, these empirical results suggest several implications that are relevant to youth employment policy in general, and to education policy in particular.

Upward socioeconomic mobility of youth is a crucial issue confronting policymakers. A key obstacle to this process is that many young persons are without jobs, a situation that is especially disturbing at least in the short run because the likelihood of near-future employment is strongly correlated with an individual's current labor force status. Our analysis has found that migration significantly raises the probability of employment among the jobless, particularly those who were in school before moving. Hence, as a general conclusion, we find that migration is an effective mechanism for enhancing the school-to-work transition.

A second facet of upward mobility is the extent to which young workers are able to increase their earnings over time. Since youth are typically among the lowest-paid workers in the labor force, the issue of wage growth is especially relevant. Our analysis has found that among employed workers, migration leads to higher gains in wage rates over the short-run than in its absence. Hence, geographic mobility can be viewed as a productive undertaking for promoting upward economic mobility once a young person has successfully entered the labor force as an employed worker.

The research has also found that the positive effects of migration are not limited to particular race/sex groups. Rather, the returns to migration appear to be similar regardless of these demographic characteristics. A most revealing result is that the wage returns to migration are more favorable for persons from lower socioeconomic backgrounds than for those from higher SES families. This implies that migration may prove to be a viable strategy for moving up the economic ladder for relatively disadvantaged youth.

The empirical results indicate that job instability, when not accompanied by a long-distance move, has a detrimental effect on wage growth. Furthermore, job changers do not reap the benefit from earning a postsecondary degree that job stayers experience. Nor does the wage growth of job changers appear to be positively affected by aptitude as it is for job stayers. Taken together, this evidence suggests that a worker's stock of human capital, and increments to it, have a significant impact on wage growth. The analysis suggests that the return to the acquisitions of new skills is influenced by the amount of time that young workers spend with a single employer. Employees who switch jobs necessarily have a discontinuous work experience and it appears as though this instability undermines the cumulative effect that (new) skills have on wage growth.

This negative phenomenon, however, seems to be confined to a short-run drop in earnings, thereafter followed by a resumption of wage growth that is comparable to other similar workers, provided that yet another job change is not forthcoming. In this scenario, then, unstable workers are less able to exploit their productive talents and fall further behind their cohort in terms of earning power, the more unstable is their pattern of employment.

The fact that migration appears to be a productive undertaking leads to the question of what factors are signficant determinants of its occurrence that are also susceptible to federal policy. An important finding is that young persons are sensitive to prevailing local economic conditions, as measured by the employment-population fatio for the three-digit zip code area in which an individual resides. This behavioral response to labor market signals has important individual and social repercussions. At an individual level, a local market with relatively poor job opportunities is more likely to stifle the upward mobility of youth both in terms of employment potential and wage growth. From the society's perspective, an efficient economy requires a flexible labor force that recognizes and repsonds to market opportunties. That recent high school graduates, on average, are influenced by market forces suggests that migration serves as an efficient allocation mechanism that has as its micro counterpart, a labor force that is more likely to be employed and better paid.

In addition to responding to market conditions, young persons also base their migation decisions on their personal economic status. That is, those who are either jobless, have relatively little employment experience, or earn low wages are more likely to move than individuals in a stronger economic position. This relationship makes sense and complements the response to market-wide signals in that it is rational for young people to consider several related economic factors in planning a move.

Another finding that confirms our a priori expectations is that the likelihood of migration is influenced by the amount and quality of information available to a potential mover. The empirical estimation found several significant factors which are related to one another in that they represent different aspects of information, and collectively, they underscore its relevance to migration. The set of high school variables embodies the various sources of information flowing to students from teachers, counselors, past graduates, and special educational programs. An individual's aptitude affects the ability to gather information. And, a person's recent migration experience raises the likelihood of a subsequent move as it provides greater exposure to alternative locations and reduces the psychic costs of a forthcoming move. In sum, the results imply that the access to and the acquisition of relevant job/location information are important conditions underlying the occurrence of a move. The analysis, however, has not been able to estimate the extent to which the outcomes of migration are circumscribed by the amount or quality of information at the migrant's disposal.

Finally, the results indicate that migration is no more likely to occur for males than it is for females, or for whites than it is for nonwhites. Socioeconomic background, however, does have a positive effect on migration, as persons from more advantaged families are more likely to move, and vice versa. This is in contrast to the wage returns to migration which were estimated to be greater for migrants from lower SES backgrounds.

Several policy implications are suggested by the above conclusions. It should be clear, however, that the available data limit the degree of specificity with which we can derive policy recommendations. For example, the provision of job information and counseling services to young persons appears to be warranted by our study. Yet, there is nothing in the data with which to specify exactly how such services should be provided - how often, under what circumstances, what details to provide, and so forth. With this caveat in mind, some of the most notable implications for policy stemming from this research are:

- Outmigration from relatively depressed localities occurs in a systematic pattern that reinforces the notion that young people act, on average, in a rational economic fashion by recognizing and responding to labor market signals. This observation is buttressed by the sensitivity of potential migrants to their own economic success in the labor market in deciding whether or not to relocate. A general implication to draw from this conclusion is that the public sector does not have to overcome inconsistent migration behavior if it chooses to enhance the mobility of the young labor force. The basic impulse is operative.

- The collective evidence regarding the role of labor market information in the migration process is clear. Access and acquisition of relevant information appears to depend on a number of sources including the high school, an individual's ability to gather and digest data, and an individual's personal labor market experience.

- The analysis is not able to determine whether or not the observed propensity to migrate is optimal from society's perspective. However, it does appear that if the public sector were to enhance the role of migration in improving the economic status of young workers, the most promising approach would be to focus on the provision of more and better job information and job counseling services. This public strategy would act to reinforce the existing tendency that has been observed by assisting individuals in making more informed decisions.

- With regard to geographic mobility, public information assistance should indicate the state of the local economy vis-a-vis employment oportunities in neighboring and more distant areas. In addition, information with respect to long term decline or growth should be conveyed, along with more detailed information on different occupational and industrial categories because job vacancies are not always evenly distributed. To the extent that this information were conveyed to potential migrants, we would expect a more optimal pattern of migration as the access to better information would tend to reinforce existing labor market signals which may be somewhat hazy to less informed persons.

- With regard to job mobility within a local area, or after relocation has occurred, public information assistance should focus more specifically an the location, requirements, and remuneration of particular jobs. The analysis has found that (1) job switchers tend to experience relative wage losses, and (2) the most widely used and most successful search methods are informal ones providing more indepth information on fewer jobs. This suggests that job changers may often switch employers without adequate information on their prospects for subsequent employment and/or that they experience difficulties in finding suitable matches. Hence, there is a need to provide information not only on available jobs but to provide more concrete data an specific employers. In addition, there appears to be a problem of access to such information, to the extent that it is already available.

- The provision of general and specific job information could also be combined with job counseling services to assist job seekers in interpreting available information and in guiding their search efforts.

- Job information/counseling may be usefully provided to high school seniors as well as to persons already in the labor force. The school counselor could help students evaluate their local employment prospects versus that in other localities. More detailed counseling would match the student's record and interests with available job requirements. If the primary responsibility for the provision of job information were to rest with the public employment service, then it may be advisable to set up job counseling sessions for students as they are about to enter the labor force.

- Academic and extracurricular achievement are commonly viewed as a central output of the education system. Our analysis also indicates that these outputs, in turn, serve as inputs into determining the labor market success of students as they enter the economic mainstream. Promotion of better academic training and provision of greater educational equality should foster more rapid mobility up the socioeconomic ladder, as well as lead to greater economic equality. The empirical results suggest that the impact of the education experience on future successes will occur directly by increasing the incidence of employment and enhancing wage growth, and indirectly by creating a more knowledgeable and flexible labor force in terms of its willingness and ability to migrate to locations offering better opportunities with which to apply their productive talents.

CHAPTER II

BACKGROUND ISSUES RELATED TO YOUTH EMPLOYMENT AND RELEVANT EDUCATIONAL POLICIES

There are a number of policy issues of national concern where the relationship between the education system and youth job search/migration behavior are both particularly relevant and potentially sensitive to public intervention. Several issues relating to unemployment, equal economic opportunity, greater socioeconomic mobility, and entrapment in rural/urban poverty pockets are identified with today's youth, especially the youngest and least educated. Educational issues can be distilled down to two basic concerns: equality of education inputs, and effectiveness and/or equality of education outputs with respect to student achievement and post-school successes. Clearly the issues related to youth employment and youth education cannot and should not be separated. While this study cannot hope to address all of the following issues, some of the most salient and urgent policy implications are:

Employment Related

- To what extent is upward socioeconomic mobility of minorities fostered by job mobility and/or migration? To what extent does greater educational opportunity influence market outcomes by eliciting greater mobility? It is quite possible that equalizing education quality induces migration, particularly for minorities, in order to take advantage of acquired skills in areas offering greater economic opportunity.
- Is outmigration of central city youth a viable avenue of escape from unemployment and poor quality jobs? Joblessness among the young is a chronic problem, yet policymakers remain uncertain of the feasibility and the value of "importing" jobs versus the polar case of "exporting" the unemployed. A key issue is the extent

to which youth are aware of more propitious alternatives, and if so, the degree to which they are responsive to differential opportunity signals in the marketplace. This is particularly germane to recent high school graduates residing in depressed, central cities.

- To what extent is the difference between male-female market outcomes a function of job search and migration decisions? Educational equality may be converted into occupational equality by the search/migration of females in order to exploit employment opportunities generated by growth in labor demand in alternative areas. If this phenomenon is taking place, an understanding of the role of the education system in encouraging and facilitating this behavior is relevant to furthering equal opportunity goals.

- Is the outcome of youth migration from rural to urban areas influenced by the quality and type of secondary education? While relocation tends to benefit better-educated persons, a potential problem is the rural-urban transfer of people without preparation for nonfarm jobs or urban lifestyles. Has this historical process been reversed in the 1970's? If so, is there regional variation in the changes of origin to destination relations?

- How important is search/migration in enhancing the flexibility of young labor force participants in response to changing demands for manpower resources (by occupation, industry, and location)?

Education-Related

- How is equal education opportunity, measured by system inputs, translated into labor market success via individual efforts to find suitable employment? Is the degree of racial desegregation related to successful search/migration activity and does it vary by minority status?

- Are supplemental compensatory education programs related to the subsequent occurrence and/or success of search/migration efforts of disadvantaged high school students?

- Is the level of education achievement significant by itself in prompting more effective search activity leading to better jobs?

- What types of school inputs (teacher, education and experience, physical resources, curriculum, school and class size, expenditures, instruction methods) are relevant to post-high school market success? Are the (lack of) effects moderated by the occurrence of search/migration activity?

- What is the role of peer group and family socioeconomic background characteristics in the search/migration process? Do individual and cohort variables influence the impacts of education system parameters on the future labor market activity of youth?

- What are the impacts of employment oriented features of the education system (vocational education, counseling, work-study programs) during and after high school?

The essential link between these two sets of issues is that (1) equal education inputs and achievement, while goals in themselves, are viewed as critical determinants of (2) equal socioeconomic opportunity. The importance of job search and job/geographic mobility is that these activities represent the mechanism by which workers and jobs are matched. While other factors are important in determining the labor market outcomes of young workers (e.g., skills, economic conditions), search and migration are potentially crucial activities in the transformation of education opportunity into economic opportunity.

Insight into the role of education in the job-location mobility process has become more essential over time. Young workers not obtaining an academic degree (especially high school dropouts for whom the NCES survey was not designed to sample), experience unusually severe difficulties in obtaining employment. Compounding this condition is the reported decline in the economic value of higher education, the consequent decline in college enrollment and increased entry of college-educated persons into occupations typically filled by high-school educated persons (e.g., clerical, sales). The former problems suggests that, for one reason or another, many youth entering the labor market after high school are not sufficiently equipped with the right levels or combinations of work skills, job information, career expectations, motivation, and so forth. The latter phenomenon suggests that there will be a growing number of individuals who decide not to pursue higher education but instead, opt only for a secondary education before entering the work force. In addition, there will be continued growth in supplementing the formal high school education with courses/training that are vocationally directed. Hence, there is a current and growing need for educators to evaluate the role of the secondary school system with respect to preparing students for the world of work. With greater insight, the education community will be in a better position to continue broadening its focus of concern to devising more effective methods for career preparation that minimize the economic hardships encountered by so many of today's youth. The following two sections briefly describe (1) the magnitude and nature of the youth unemployment problem, and (2) the steps undertaken by the education system to alleviate some of these problems, including a brief summary of recent efforts to evaluate the output of education inputs.

A. OVERVIEW OF YOUTH MIGRATION PROBLEMS

The unemployment rates among young workers, primarily ages 16 to 19 and to a lesser extent those in their early 20's, have not only remained disproportionately high relative to prime-age adults, but have increased over time. This chronic problem is evident from table 1 which distinguishes among various age-sex-race groups. Aside from the high overall unemployment rates for youth, several important differences emerge from the statistics. First, within each age-racial group, there has been a secular convergence in male and female unemployment rates, primarily because of the greater deterioration in male employment. Second, the large disparity between white and nonwhites has not changed appreciably over time, with the latter experiencing almost twice the percentage of unemployment of the former. Third, the degree of unemployment drops substantially with age for all sex-race groups. The last observation raises the central questions of what are the long run repercussions of youth joblessness and how do future labor market outcomes depend on the amount and type of employment experienced during their years in the labor force? This, unfortunately, remains an open question pending future empirical research.

The severity of youth unemployment, however, is understated by table 1. The labor force participation rates in table 2 show a steady decline in participation for nonwhite males (principally black) in all age groups, and a smaller drop for nonwhite females aged 18-19. In contrast, the participation rates for white males and females have been increasing over time, as have the rates for certain nonwhite female groups. This suggests a further source of racial differences in that some groups are appearing more reluctant to seek employment, possibly in response to the poor job opportunities that are perceived (i.e., the discouraged worker syndrome).

If youth are enrolled in school part-time and are looking for work, then measured unemployment may overstate the problem. However, as table 3 documents, the percentage enrolled in school varies little by race but the rates of unemployment continue to be dramatically different by race and

TABLE 1

UNEMPLOYMENT RATES,[1] BY RACE, SEX, AND AGE, 1967-76

Item	Total 16 years and over	16 and 17 years	18 and 19 years	20 to 24 years	25 to 34 years
WHITE					
Males					
1967	2.7	12.7	9.0	4.2	1.9
1968	2.6	12.3	8.2	4.6	1.7
1969	2.5	12.5	7.9	4.6	1.7
1970	4.0	15.7	12.0	7.6	3.1
1971	4.9	17.1	13.5	9.4	4.0
1972	4.5	16.4	12.4	8.5	3.4
1973	3.7	15.1	10.0	6.5	3.0
1974	4.3	16.2	11.5	7.8	3.5
1975	7.2	19.7	17.2	13.2	6.3
1976	6.4	19.7	15.5	10.9	5.6
Females					
1967	4.6	12.9	10.6	6.0	4.7
1968	4.3	13.9	11.0	5.9	3.9
1969	4.2	13.8	10.0	5.5	4.2
1970	5.4	15.3	11.9	6.9	5.3
1971	6.3	16.7	14.1	8.5	6.3
1972	5.9	17.0	12.3	8.2	5.5
1973	5.3	15.7	10.9	7.0	5.1
1974	6.1	16.4	13.0	8.2	5.7
1975	8.6	19.2	16.1	11.2	8.5
1976	7.9	18.2	15.1	10.4	7.6
BLACK AND OTHER					
Males					
1967	6.0	28.9	20.1	8.0	4.4
1968	5.6	26.6	19.0	8.3	3.8
1969	5.3	24.7	19.0	8.4	3.4
1970	7.3	27.8	23.1	12.6	6.1
1971	9.1	33.4	26.0	16.2	7.4
1972	8.9	35.1	26.2	14.7	6.8
1973	7.6	34.4	22.1	12.6	5.8
1974	9.1	39.0	26.6	15.4	7.2
1975	13.7	39.4	32.9	22.9	11.9
1976	12.7	37.7	34.0	20.7	11.0
Females					
1967	9.1	32.0	28.3	13.8	8.7
1968	8.3	33.7	26.2	12.3	8.4
1969	7.8	31.2	25.7	12.0	6.6
1970	9.3	36.9	32.9	15.0	7.9
1971	10.8	38.5	33.7	17.3	10.7
1972	11.3	38.3	38.7	17.4	10.2
1973	10.5	36.5	33.3	17.6	9.7
1974	10.7	36.2	33.7	18.0	8.6
1975	14.0	38.9	38.3	22.5	12.9
1976	13.6	46.0	35.0	21.7	13.0

SOURCE: Handbook of Labor Statistics 1977, DOL/BLS, Bulletin 1966, Table 56.

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[1] Calculated by dividing the number of unemployed looking for work by the total number of labor force participants (employed and unemployed).

TABLE 2

CIVILIAN LABOR FORCE PARTICIPATION RATES[1] FOR PERSONS 16 YEARS AND OVER, BY SEX, RACE, AND AGE, 1967-76

Item	Total 16 years and over	16 and 17 years	18 and 19 years	20 to 24 years	25 to 34 years
WHITE					
Males					
1967	80.7	47.9	66.1	84.0	97.5
1968	80.4	47.7	65.7	82.4	97.2
1969	80.2	46.8	66.3	82.6	97.0
1970	80.0	48.9	67.4	83.3	96.7
1971	79.6	49.2	67.8	83.2	96.3
1972	79.6	50.2	71.1	84.3	96.0
1973	79.5	52.7	72.3	85.8	96.3
1974	79.4	53.3	73.6	86.5	96.3
1975	78.7	51.8	72.8	85.5	95.8
1976	78.4	51.8	73.5	86.2	95.9
Females					
1967	40.1	32.3	52.7	53.1	39.7
1968	40.7	33.0	53.3	54.0	40.6
1969	41.8	35.2	54.6	56.4	41.7
1970	42.6	36.6	55.0	57.7	43.2
1971	42.6	36.4	55.0	57.9	43.6
1972	43.2	39.3	57.4	59.4	45.6
1973	44.1	41.7	58.9	61.6	48.5
1974	45.2	43.3	60.4	63.6	51.1
1975	45.9	42.7	60.4	65.4	53.5
1976	46.9	43.8	61.8	66.2	55.8
BLACK AND OTHER					
Males					
1967	78.5	41.2	62.7	87.2	95.5
1968	77.6	37.9	63.3	85.0	95.0
1969	76.9	37.7	63.2	84.4	94.4
1970	76.5	34.8	61.8	85.5	93.7
1971	74.9	32.4	58.9	81.5	82.9
1972	73.7	34.1	60.1	81.5	92.7
1973	73.8	34.4	61.4	81.8	91.7
1974	73.3	34.6	62.4	82.1	92.3
1975	71.5	30.1	57.5	78.4	91.4
1976	70.7	30.2	55.6	78.4	90.6
Females					
1967	49.5	22.8	48.7	54.9	57.5
1968	49.3	23.3	46.9	58.4	56.6
1969	49.8	24.4	45.4	58.6	57.8
1970	49.5	24.3	44.7	57.7	57.6
1971	49.2	21.9	41.4	56.0	59.2
1972	48.7	21.4	43.9	56.7	60.1
1973	49.1	24.3	45.1	57.5	61.0
1974	49.1	24.2	44.6	58.2	60.8
1975	49.2	26.5	45.1	56.2	61.4
1976	50.2	23.9	43.3	57.9	65.3

SOURCE: Handbook of Labor Statistics 1977, DOL/BLS, Bulletin 1966, Table 4.

[1] Calculated for the noninstitutional population.

TABLE 3

LABOR MARKET STATUS OF TEENAGERS BY RACE AND SCHOOL ENROLLMENT STATUS, OCTOBER 1975

Age	Race	% In School	In school			Out of School		
			UN	PR	EP	UN	PR	EP
16-17	White	89.3	17.4	43.9	36.3	30.4	60.2	41.9
	Black	87.2	27.7	18.8	15.5	68.9	55.6	17.3
18-19	White	46.5	13.4	53.7	46.5	16.3	79.9	66.9
	Black	49.6	19.8	31.4	25.2	37.3	66.6	41.8

SOURCE: BLS Special Labor Force Report No. 191.

age, as are the rates of labor force participation (PR) and the employment-population ratios (EP).

The geographic distribution of teenage (ages 16 to 19) unemployment offers further insights. As noted in a draft report by the Council of Economic Advisors (CEA 1977), 61 percent of measured black teenage unemployment in early 1977 was concentrated in central cities, in contrast to only 23 percent of white unemployment. Despite the differences in densities of black and white unemployment, black teenagers fare almost as badly with respect to whites in all types of locations (see table 4). This implies that a random reshuffling of jobless black youth away from cities would not necessarily improve their employment prospects. As noted by the CEA report, location factors are estimated to account for only 5.4 percent of the gap between black and white unemployment rates. Clearly, an effort to increase youth employment must enhance the job search effort within each locality as well as improve the selectivity of job-related migration prompted by employment opportunities in alternative destinations.

TABLE 4

POPULATION, UNEMPLOYMENT, AND EMPLOYMENT RATES OF TEENAGERS BY RACE AND LOCATION, 1977

Geographic Residence	Population (000's)		Unemployment Rate		Employment Population Ratio	
	White	Black	White	Black	White	Black
Central City						
Poverty	346	675	21.7	49.6	.355	.156
Non-Poverty	2,756	693	17.3	46.4	.489	.210
Suburbs						
Poverty	230	126	18.0	51.0	.436	.191
Non-Poverty	5,842	394	15.0	32.7	.534	.266
Non-Metropolitan						
Poverty	1,442	426	16.6	27.9	.460	.255
Non-Poverty	3,367	197	16.3	30.7	.517	.309
Total	13,983	2,493	16.1	40.5	.508	.219

SOURCE: Council of Economic Advisors, 1977.

One of the distinguishing features about youth unemployment versus that for older workers, is that unemployment among the former is much more likely to be associated with entry and re-rentry into the labor force. As shown in table 5, this situation is especially pronounced for black teenagers, and there is not much difference by sex within racial groups. These statistics suggest that young workers encounter a number of difficulties in finding jobs rather than in keeping jobs. The reason behind the relative lack of employment success, however, is unclear (i.e., poor choice of search methods, little effort spent looking for jobs, unwillingness to move to more propitious geographic areas, unrealistic job demands, poor local labor market conditions).

TABLE 5

UNEMPLOYMENT RATES BY REASON, 1976

Reason for Unemployment	Males (16-19) White	Males (16-19) Black	Females (16-19) White	Females (16-19) Black	Males (20+)	Females (20+)
Total	17.3	35.5	16.4	38.9	5.9	7.4
Lost Last Job	5.0	7.7	2.8	5.9	4.1	3.2
Left Last Job	1.6	1.6	1.6	2.8	.6	1.2
Reentrants	4.7	11.2	4.7	12.9	1.0	2.6
New Entrants	6.0	14.5	7.2	17.3	.2	.4

SOURCE: Employment and Training Report of the President, 1977, table A-25 and unpublished BLS data (presented in Coucil of Economic Advisors, 1977).

In sum, solutions to youth unemployment must recognize that young workers often face a number of socioeconomic problems. There are significant barriers to equal employment opportunities and labor mobility that are most severe for blacks and most common for central city residents. While there are a number of potential causes, job-location search and mobility are potentially important links in the transition of high school graduates into employment. To the extent that this form of individual behavior is important, then it makes good sense to scrutinize educational inputs so as to enhance the process through better high school preparation and/or provision of post-secondary counseling and training that are explicitly job-oriented.

B. OVERVIEW OF YOUTH EMPLOYMENT AND EDUCATION POLICY ISSUES[1]

Educators have traditionally been concerned with the quality of schooling received by students. While the concept of quality is multifaceted and difficult to measure, this overall goal has been viewed from two perspectives: (1) provision of equal access to education opportunities, and (2) provision of effective system inputs so as to maximize various school outputs within resource constraints. The first objective stems from the firm belief that society is obligated to provide education equally to all who seek it. The second has been associated primarily with intellectual achievement.

More recently educators have begun to place increasing emphasis on the role of education in enhancing labor market success, although the two outputs are certainly linked. The concern with post-school socioeconomic outcomes has become fused with the goals of equal access to education, because of the latter's importance as a requisite to equal (access to) economic opportunity. This, in turn, has led to compensatory education programs as well as to equal access in order to enhance the future prospects of currently disadvantaged groups. Consistent with this merging is the redefining of the equal access objective by some educators to one of equality of educational achievement for all students.

Efforts to provide equal access to education opportunities have primarily revolved around (1) racial desegregation of primary and secondry schools, and (2) providing additional funds to schools in low-income districts to meet the special education needs of disadvantaged students. Many have argued that segregation _per se_ contributes to lower academic achievement of black students, aside from differences in school resources (see

Weinberg, 1977, for research on learning effects of desegregation). In 1972, Congress enacted the Emergency School Aid Act (ESAA) to provide financial assistance to school districts attempting to end segregation. For FY 1977, $240 million was to be appropriated across states, primarily according to the number of school-aged children.[2] Crain (1973) evaluates the federal Emergency School Assistance Program (ESAP), the predecessor to ESAA, and finds that achievement scores of black males in ESAP high schools were half a grade level higher than similar black males in non-ESAP schools. Most researchers believe that mixing disadvantaged students with those from more advantageous backgrounds leads to greater motivation, better work habits, and possibly transmission of skills through interaction for the disadvantaged. Any negative effects of desegregation on white students appear to be negligible if measureable at all. There has been, however, no evaluation of post-school effects of racial desegregation.

A number of equal education opportunity proponents have urged desegregation not because of its independent impact on black achievement, but because it offers much greater assurance of access to better education resources than is available to predominantly black schools, either because of underfinancing in low-income areas, or unequal resource allocations made at the district level.

Aside from problems engendered by segregation, low-income communities, in general, have suffered from unequal education resources vis-a-vis more affluent localities. Title I of the Elementary and Secondary Education Act (ESEA) was designed to funnel money to schools serving high percentages of children from low-income families. Title I funds have been intended as a supplement to school district resources devoted to ESEA schools, not as a replacement for local expenditures. In fact, the Title I program represents an attempt to provide unequal resources, targeted in favor of disadvantaged students. In this sense, there has been a deliberate policy shift toward greater equality of student achievement (output) and away from equality of inputs.

Title I of ESEA is also intended to provide federal assistance to schools in overcoming many of the learning handicaps of disadvantaged students that ordinarily would have posed severe problems for standard curricula. Compensatory education is not targeted by race, but is intended for students' for whom the regular school programs are not effective. It is estimated that over $2 billion is spent annually by the Federal Government for compensatory education (and an additional $.5 billion by the states). In addition, ESEA provides funds for programs to meet the education needs of minority children.

The Vocational Education Act represents an attempt both to help disadvantaged students (through set-aside requirements) and to prepare students in general for specific types of employment, thereby enhancing the school-to-work transition and avoiding the social costs incurred through post-school employment. In 1975, $536 million was spent by the Federal government to support vocational education.[3]

The effectiveness of these federal programs on secondary school students, as well as the impact of other system inputs, is mixed. The consensus seems to be that students participating in compensatory programs achieve greater academic achievement than noncompensatory students.[4] However, at least part of these relative gains are lost during the summer and when compensatory students re-enter regular school programs there are few discernible differences. This seems to underscore the importance of family/peer/community reinforcement of skills and attitudes picked up in school. Students enrolled in ESAA funded schools have not been found to outperform those in non-ESAA shools.[5] Evaluation of vocational education is also mixed. Little has been done to contrast the unemployment and wage rates of vocational versus nonvocational students. Grasso (1975) finds few differences in job market success between vocational and general students, and even these melt away within five years.

Innumerable studies have dealt with the impact of different school inputs on various measured school outputs. The Coleman Report in 1966 has stimulated considerable discussion over the effectiveness of school resources, primarily in terms of academic achievement. The latter is generally thought to be a function of a student's innate abilities and socioeconomic status, teacher quality, non-teacher school resources, and peer group characteristics. The relationship has been viewed both as a production function and as an input-output relationship. The gist of the Coleman Report findings is that there is little evidence to support the positive role of school and teacher resources on student achievement. Instead, noneducational factors such as parental income and education, peer associations, and the socioeconomic status of the community have been found to be the most important and significant predictors of student achievement.

A number of criticisms have been voiced about the data, measures, and methodology used by Coleman and others. First, school inputs were measured by school-wide averages rather than more appropriate student-specific data. Second, achievement has been measured as a level of output, when a more insightful measure would be the change in achievement.

Summers and Wolf (1977) focus on the changes in achievement between grades three and five. While the sample obviously does not coincide with ours, the findings are suggestive of the importance of variable measurement and methodology. They found that the use of end-of-period achievement level as an output measure, without controlling for beginning-of-period level (as done in most studies such as Coleman), obscured the estimated role of inputs in affecting learning growth. The use of school and district averages, rather than student-specific proxies for school inputs into student achievement, introduced so much statistical noise that estimates of the input effects were insignificant. The use of school-wide averages often produced opposite (thereby offsetting) effects of school inputs according to the socioeconomic status of the student. Their study found that low-income students were especially responsive to controllable inputs such as teacher credentials, size of school and classroom, mix of fast and slow learners, and the racial composition of the student body.

There is relatively little known about the effectiveness of school inputs on post-school performance, usually measured by employment status and earnings. This lack of knowledge is unfortunate because the post-school time during which individuals interact in society and the labor market is long and the capabilities learned in school are probably of great importance. It is partially to remedy this situation that has motivated NCES to fund a series of studies that use the National Longitudinal Study of the High School Class of 1972.

FOOTNOTES

1. This section has benefited particularly from "Inequalities in the Education Experience of Black and White Americans," U.S. Congressional Budget Office, 1977.

2. Ibid., p. 15.

3. Ibid., p. 16.

4. Ibid., p. 20.

5. Ibid., p. 22.

CHAPTER III

REVIEW OF THE LITERATURE

This chapter provides a background with which to interpret the analysis results discussed later in this report. It is divided into four parts that discuss the conceptual and empirical analyses of geographic mobility and job search activity, their implications for individual labor market outcomes, and topics requiring further research.

A. CONCEPTUAL AND EMPIRICAL ANALYSIS OF GEOGRAPHIC MOBILITY

The migration literature is both massive and diverse as researchers from a variety of disciplines have investigated residential and geographic mobility. To a large extent, the diversity of approaches to the study of mobility stems from the methodological problems in defining mobility itself, for it encompasss different clusters of people moving over different units of time and space. In particular, the geographic area of analysis has been variously defined as the county, SMSA, state, and region; both intra and inter area moves have been analyzed; the time period has ranged from one to five-year intervals; and the subject of analysis has varied from individuals and families, to gross and net flows into and out of areas, to rates of movement standardized by the size of a particular subgroup or an area's total population. Further compounding the interpretation of results are the diverse data sets which have included case studies, crosssection and timeseries aggregate data, and more recently, micro longitudinal data files.

Geographers have been primarily interested in the spatial aspect of migration which has led to a distillation of mobility into geometrical elements such as distance, direction of flows, size, and intervening opportunities. Zipf (1946) pioneered the gravity concept that relates the flow of migration to the multiplicative sizes of the relevant origin and destination populations and inversely with intervening distance. The model, however, has received conflicting support as Shaw (1975) and VanValey (1971) have found that population sizes have varying impacts, in contrast to Olsson (1965) who finds empirical confirmation with his Swedish data set. The primary weakness of the gravity model is that it represents an effort to find a theory to fit the data and does not offer much substantive explanation of mobility.

In contrast to geographers who have premised their work on the assumption of an homogeneous population, sociologists and demographers have assumed a relatively fixed environment populated by heterogeneous individuals. A key motivating force behind this line of research is that the population does not exhibit a uniform propensity to move. On the contrary, the push-pull forces inducing mobility seem to exert such dissimilar effects across subgroups, that socio-demographers have attempted to identify the apparent self-selection process by which potentially mobile individuals differentiate themselves from the sedentary population.

The perspective taken by the self-selection approach is that individuals can be arrayed along a continuum ranging from a high to low likelihood of mobility. Implicit is a threshold below which migration is not perceived to be worthwhile. The threshold varies across individuals and also over time for the same person. Within this framework, an effort has been made to empirically identify what factors explain the variation in thresholds and thereby mobility. Three basic sources influencing the decision to move include the life cycle, labor market constraints, and prior migration experience.

Age, marital status, family size and composition, and retirement have been noted as relevant facets of the life cycle. Age appears to have a gradual inhibiting effect while changes in marital and labor force status seem to elicit mobility. Occupational status has been cited as a structural constraint where, for example, the self-employed face a stronger retarding force because land, physical capital, and customers are not easily transported. Past migration has been linked to either an inherent and/or acquired predisposition to move. Because large fractions of the population can be categorized by stayers, habitual movers, and occasional movers, Markov and semi-Markov chain models have been applied to the process of mobility. While this literature has produced a rich taxonomy of household decision-making, most studies have not developed behavioral models which provide specific hypotheses that can be either accepted or rejected by the data. (See Quigley and Weinberg, 1977; Hanushek and Quigley, 1978, for further discussion.)

A fundamental stimulus to *economic* research on mobility is that the presence of mobile resources is a necessary assumption underlying the movement toward price and wage equalibria across spatially distributed markets. The efficient allocation of manpower resources and the role of mobility as a mechanism for its attainment has received most of the attention. However, a systematic approach to modeling mobility behavior awaited the evolution of the human capital literature. Following Schultz (1962) and Becker (1962), Sjaastad (1962) applied the concept of investment in human capital to the decision to move. In this context, a potential migrant considers the net benefits to moving in relation to the costs incurred. Because the net gains may accrue over time, the individual is presumed to discount the stream of benefits, net of costs and benefits foregone by moving, to obtain the present value of undertaking a move. A positive value prompts migration to the destination offering the greatest return.

The human capital model is founded on the principle of individual utility maximization, although its application has been generally restricted to income objectives. The usefulness of the model is not that individuals engage in complex benefit-cost calculations, but that they behave as though they do. On this premise, the model provides a framework for integrating a number of behavior rules and then deriving a set a testable implications acording to the calculus of constrained optimization.

Modifications have enriched the human capital model as nonpecuniary benefits and costs have been incorporated into analyses. Some of the more recent adaptations have meshed location search theory under conditions of imperfect information with geographical mobility (Schwartz, 1976; Polachek and Horvath, 1977). The unit of analysis has also been enlarged to incorporate features of the family life cycle (e.g., working spouse, school-aged children) that inhibit movement because of implied psychic and financial costs of relocating (Sandell, 1977; Mincer, 1978). This broadening of focus suggests a gradual convergence of the sociological and economic approaches to mobility.

One of the most widely replicated findings in the empirical literature is that distance acts as a deterent to geographic mobility for all groups. This inverse relationship has been attributed to the role of distance as a proxy for transportation and psychic costs. A number of researchers, however, have argued that transfer expenses are fairly small in relation to the likely benefits to be gained from moving (Gallaway, 1967; Nelson, 1959; Sjaastad, 1962; Wadycki, 1974). In one of the few studies using a national survey of households, Lansing and Mueller (1976) use cost data on 495 individual moves made between 1962 and 1963. They surmised that 45 percent of the movers incurred total direct costs of less than $50 which casts doubt on the importance of transportation costs in retarding mobility. As noted in a major literature survey by Greenwood (1975), one of the important unresolved issues is the extent to which pecuniary and nonpecuniary factors are imbedded in the distance variable.

The *level of education* is found by Hamilton (1964) and Shryock and Nam (1965) to be a significant factor underlying migration selectivity. This supports the finding of Folger and Nam (1967) that the poorly educated are as likely to be involved in short-distance moves as the more highly educated, but the latter are much more likely to undertake a long-distance move. Schwartz (1973, 1976) examines the role of information in constraining mobility by developing a loation search model which links search ability to education. Better educated persons are presumably more proficient at acquiring information on jobs, houses, and environmental characteristics. Schwartz finds that the negative effect of distance on interstate migration within age groups declines as the level of education rises.

A potential source of information on alternative destinations is that collected from friends who have previously migrated. Greenwood (1969) develops the notion of *migrant stocks* as a rough index of information flows between regions. He finds that gross movement from state i to j is significantly affected by the number of residents in state j who had previously lived in the state i. Rogers (1968) finds that 1950-1960 inter-SMSA gross flows were positively related to migrant stocks represented by movement during the previous decade.

Virtually all empirical studies find a negative association between age and mobility. Younger persons are likely to be more adaptable to new situations and have fewer social ties to severe than older persons. The young also have longer work lives over which to realize the monetary benefits of relocating. Gallaway (1969) argues that both job security and family ties are more important constraints for older than younger persons.

The response of population flows to income differentials is a crucial phenomenon in the allocation of manpower resources. Using mean or median values of wage rates or earnings, researchers have found a positive tie between income and interstate migration (e.g., Greenwood, 1970, 1973). A common finding, however, is that income explains inward but not outward movement (Perloff, 1960; Lowry, 1966). A problem typical of dealing with aggregate data is that in and out migration in a given area are highly correlated. For example, Polachek and Horvath (1979) point out that 272,000 persons moved to Connecticut, a high wage state, during the 1965-70 period. This suggests that individuals move to increase their income. However, during the same time period, 250,000 persons left Connecticut. The small difference between the two flows tends to confound empirical analysis using aggregate data. The seemingly paradoxical flows, of course, are not necessarily contradictory to the appropriateness of mobility models based on individual behavior. The overlap in wage rates and job opportunities between regions is sufficiently great to account for flows in both directions while individuals are simultaneously improving their economic positions. Nevertheless, this illustrates the tenuous tie that often exists between aggregate relationships and individual decision-making.

Gallaway (1969) uses the Social Security One-percent Continuous Work History Sample in 1960 to examine the impact of regional migration on incomes. He notes that long distance mobility is often accompanied by changes in industry so that an evaluation of mobility investments must be carefully disentangled from other forms of human capital investments. Gallaway finds that, on average, geographical mobility pays while industry mobility does not. Fabricant (1970) and Curtis (1969) contrast short and long distance moves and find that the former are much less responsive to wage differentials than are the latter.

Differences in unemployment rates are another source of economic push-pull forces. The evidence, however, is inconclusive (Greenwood, 1968; McInnis, 1969; Rogers, 1968; Miller, 1973). Greenwood (1975) considers this insignificance as one of the most perplexing problems confronting migration researchers. Part of the problem is recognized as statistical in that some analyses have used state end-of-period unemployment rates to explain prior migration which creates simultaneous equation biases. Lansing and Mueller (1967) note that unemployment tends to be highest among the least mobile groups: the low skilled, poorly educated, teenaged, and aged. Fields (1976) argues that the unemployment rate is a poor approximation of the theoretical concept of the probability of locating and retaining a job. He finds that area turnover rates are statistically superior in predicting gross SMSA mobility compared to area unemployment rates.

Climate, measured by area temperature differentials, has been used to capture the effect of physical amenities. Greenwood (1969) finds that relatively warmer climates elicit immigration, and Greenwood and Gormely (1971) find the effect holds for whites but not nonwhites.

Cebula, Kohn, and Vedder (1973) examine black interstate migration between 1965 and 1970 and find a positive correlation between state per capita *welfare benefits* and immigration. Glantz (1973) suggests that potential rather than per capita benefits should be used because higher income persons are unlikely to qualify for public assistance. Glantz finds that 1965-1970 migration rates are positively tied to state benefits paid relative to the advantaged population. Overall, the empirical literature has not provided much policy insight. Hence, while several determinants of mobility have been isolated, they are not generally amenable to public sector influence.

A number of researchers have noted that a large proportion of observed mobility can be attributed to a relatively constant subset of the total population. Analytically, the population has been dichotomized into stayers and movers using a Markov chain to formally describe movement with a matrix of fixed transition probabilities. Accordingly, the population at risk to migration is disaggregated as a function of previous migration histories, where the likelihood of moving is dependent on how long a person has resided in a locality as of today and the path that brought him there. This notion has been coined as the axiom of *cumultive inertia* implying that duration in residence fosters increasing social and employment ties, thereby raising the costs of long-distance mobility.

Empirical analyses of this phenomenon have necessarily relied on longitudinal data. Morrison (1970) uses the Survey of Economic Opportunity and the Social Security Continuous Work History Sample and finds that the most significant predictor of migration was "last year's residence in a different house." Only 4.2 percent of those who had not moved in the last eight years were found to move in the ninth year. Meyers et al. (1967), Land (1969), and Rogers (1969) find additional support using case study data sets.

The availability of national longitudinal samples of individuals, such as the Michigan Panel Study of Income Dynamics (PSID) and the National Longitudinal Surveys (NLS), has made possible a more precise and in-depth analysis of the individual and family characteristics that influence the decision to migrate. Several recent studies have provided new insights into the effects of family life cycle patterns on mobility. The decision to migrate is presumed to be a family rather than an individual (e.g., husband) decision. This is particularly relevant in the case of working husband and wife families where the choice of destinations is based on potential earnings of both husband and wife. Mincer (1978) demonstrates theoretically that a dual-worker household is less able, on average, to find a location that maximizes its combined earnings than if the husband and wife moved independently to the location that maximized their respective incomes. Hence, the net returns to migration tend to be lower for households with a working wife than for those where only the husband is employed, and vice versa.

Mincer (1978), using the NLS samples of younger and older men, find that a *working spouse* significantly reduces the probability of moving as well as the distance traveled among mobile households. Mincer also finds that marriage by itself has a significant effect on mobility, but it loses statistical significance with the inclusion of the wife's work status, her education, and earnings. Sandell (1977) uses the NLS sample of women (ages 35-49 in 1972) and also finds that white, husband-wife households are significantly less inclined to undertake intercounty moves when the wife is working, *ceteris paribus.* Sandell finds that this negative relationship becomes more pronounced as the wife's job tenure increases.

The presence of *school-age children* has been found by Sandell (1977) and Mincer (1978) to be a constraining force. Long (1972) uses CPS data and his tabulations reveal that married couples with children migrate less freqeuntly than childless couples for 11 age groups, and at ages 25 to 44, couples with school-age children are only half as likely to move than are couples with only pre-school children. Polachek and Horvath (1977) use the PSID data on intact husband-wife families and find that interstate migration is significantly and negatively related not only to school-aged children, but also to the presence of *nearby relatives*. The latter is one of the few empirical accounts of the role of social networks in the migration process.

Kalunzy (1975) uses the PSID data and finds that *family income* has a positive effect on intermetropolitan migration, and that age, duration in residence and nonwhite status have negative effects. More recently, there have been efforts to refine the investigation of the pecuniary incentives to migrate. Polachek and Horvath (1977) impute potential earnings gains to their PSID sample and estimate a significant impact on household migration. DaVanzo (1978) constructs the present values of moving to alternate census divisions and finds varying effects on interdivisional mobility. In general, husbands in the PSID sample who are either unemployed or employed but looking for work, are sensitive to earnings opportunities. Estimates of nonwage family income effects on migration are conflicting, most likely because the empirical measures contain (individual perceptions of) location-specific income, such as Unemployment Insurance benefits and rental income.

Both DaVanzo (1978) and Polachek and Horvath (1977) find that recent migration invariably is correlated with the probability of future migration. DaVanzo examines the previous migration experience more closely and finds an important difference between return movers and those who move to yet another destination (onward movers). Those households who have recently migrated back to a former origin are no more likely to move again than are those who have not moved within the past five years. Further, households who have recently migrated are considerably more likely to move again if the husband is unemployed or employed but looking for work. This suggests that the recent move was, to some extent, deemed unsuccessful.

The migration response to local unemployment conditions has proven to be an elusive phenomenon to estimate. Part of the problem is undoubtedly due to poor extant data on local labor market conditions. DaVanzo (1978) has found an interesting relation with her PSID sample of intact husband-wife families. That is, families with an employed head appear to be insensitive to the level of the local unemployment rate in deciding whether or not to migrate. In contrast, the likelihood of families migrating with an unemployed head is estimated to be significantly and positively related to the unemployment rate. This suggests that the "push" effect of poor local job opportunities is more relevant for workers without jobs than for those already employed. Roistacher (1974) attempts to identify family characteristics of movers using the PSID data. She finds that homeowners exhibit less residential mobility than nonowners. Households also appear to adjust the size and location of their dwelling units in response to changes in their financial and family status. Goodman (1974) constructs a per capita index of internal space needs and finds that relatively cramped quarters lead to a greater probability of changing residences.

Sandell (1977) finds that intercounty migration is significantly and negatively related to the husband's age and positively associated with the husband's educational attainment. Polachek and Horvath (1977) find that the wife's level of education is negatively related to family migration. The latter may be due to the correlation between a wife's education and her job status (tenure, occupational status, earnings). The positive tie between migration and husband's education is expected because the geographic boundaries of the labor market are thought to be larger for the more highly educated. In addition, education is believed to impart skills for gathering and assessing information which would enhance the probability of finding more attractive locations/jobs. The negative relationship between migration and wife's education is explained best in terms of the inhibiting effect of a working spouse. With the exception of years of formal education, there has not been any analysis of the influence of an individual's educational experience on geographic mobility.

B. CONCEPTUAL AND EMPIRICAL ANALYSES OF JOB SEARCH ACTIVITY

The key stimulus to the evolution of search theory has been the concern over the efficient operation of the labor market. Because of the persistence of unemployed resources concurrent with high levels of aggregate demand and the dispersion of wage rates for similar workers in similar locations, there is ample reason to question the market's ability to attain an equilibrium rate of remuneration that is uniform across comparable workers. Focus on job search activity has sought to gain insight into this phenomenon in order to enhance the process by which worker skills are matched effectively with employer job requirements.

Search models drop the assumptions of classical economics that (1) workers and firms are homogeneous, (2) information is perfect and freely available, and (3) mobility across jobs and geographic locations occurs in a frictionless world. Without these standard assumptions, there is considerable justification for economic agents to search.

Based on several assumptions of worker objectives, optimal patterns of search behavior have been formulated where three decisions are made: (1) whether or not to engage in search; and if affirmative, (2) what job acceptance standards to set; and (3) what methods to use and how intensively to search. In search models, the subject of analysis is the individual worker, either employed or unemployed, who seeks to maximize the expected lifetime value of labor income or utility (i.e., satisfaction). All models make the explicit assumption that a worker is congnizant of the distribution of available job offers, given his skills and market conditions. Knowledge of the location and the particulars of any one offer, however, is not presumed. In order to learn of vacancy locations, terms, and job requirements a worker must search.

Stigler (1962) developed a model of search in which a worker determines the optimal number of job inquiries to make given the wage offer distribution and costs of search. Offers are accumulated and at the conclusion, the best is accepted. The optimal decision rule in this context reduces to adjusting the number of inquiries until the increase in the expected wage offer is just equal to the added cost of another inquiry. In this static model, the economic problem facing a worker is simply how many units of search to undertake. The most serious limitation of this model is the absence of a minimum acceptance criterion below which offers are rejected.

A second generation of models (e.g., McCall, 1970; Mortensen, 1970; and Gronau, 1971) has concentrated on the job offer standard, although in adopting this focus, they have ignored the level of search activity as a decision variable. Instead, offers are presumed to arrive periodically and a worker must pay a fixed price to learn of each offer's contents, its skill requirements and its remuneration. A critical assumption of their models is that offers must be either accepted or rejected as they arrive. Hence, search becomes a sequential process whereby a worker decides whether or not (1) to search, (2) to accept an offer, or (3) to reject an offer and continue on the job hunt.

The general problem facing an individual considering a number of "searches" over time in this context is to determine when to stop and accept an offer. Optimal stopping rules have been developed which yield an acceptance or reservation wage rate (this could, of course, be broadened to encompass an index of job qualities), that sets a lower bound for accepting offers as they accrue. Intuitively, this makes good sense. A worker should not accept an offer if he believes he can do better by continuing the search.

More recently, models have been developed which consider the joint determination of the reservation wage and the level of search activity as explicit search decisions (Barron and McCafferty, 1977; Black, 1980a; Mortensen, 1977). The optimal decision rules derived from these more general models provide a richer set of testable hypotheses regarding the empirical determinants of search intensity, job acceptance standards, and subsequent market outcomes. In assessing job offers, a worker is interested in more than just the wage rate, although models generally use a single dimensional objective. Other objectives that may be considered include job security, commuting costs, advancement, fringe benefits, interesting work, congenial colleagues, and on-the-job-training. Another omission of search models is the channels by which workers seek employment. Both formal (public and private employment services) and informal (direct employer contacts, newspaper ads, friends) are used by job seekers to find employment. Research is needed on which methods are used, which result in jobs, and how formal and informal search techniques maybe substitutes or complements to one another.

The empirical estimation of models of the determinants of job search have been rather limited using national, individual data sets. The probability of job search among employed workers has been investigated by

Black (1980a) using the Michigan Longitudinal Panel Study, and the intensity of search among unemployed workers has been analyzed by Barron and Mellow (1977) using matched Current Population Survey records.

A central theoretical predictor of search is the *expected hourly return to search* relative to an employed worker's current wage rate. Black (1980a) finds that search is indeed more likely, the greater is a worker's potential market wage rate which buttresses the notion that individuals are responsive to pecuniary market signals.

The expected gain resulting from search is influenced by the chance of finding an acceptable job offer for a given unit of search effort. Factors such as an individual's skill in gathering and assessing market information, conducting interviews, filling out applications, and taking exams are relevant. The *level of formal educational attainment* has been found to be positively related to search which implies that schooling, apart from its direct effect in the production of skills, enhances a worker's search skills. The impact of *verbal ability* has also been found by Black to encourage search, suggesting that communication and interview abilities enhance the likelihood of finding and eliciting offers and, hence, encourage search.

Local labor market conditions theoretically influence both the likelihood and the outcome of search. Large city size may imply a greater density of potential job vacancies per job seeker and the data have consistently supported this view. A relatively tight labor market is predicted to stimulate search because of the greater number of potential vacancies. While this effect has the expected impact on search, it has not been estimated with much statistical reliability.

The costs of search, in terms of foragoing employment in favor of unemployment, can be reduced for workers rceiving *UI benefits* and other *family income*. Both sources of income have been found by Barron and Mellow to significantly reduce the search effort of unemployed workers. Workers who were *laid off* are less inclined to search than similar workers who *quit* their last job, suggesting that anticipation of recall dampens that incentive to look for alternative employment.

Age is consistently found to be negatively related to search which is reasonable given the early trail-and-error job experience of young workers who are looking for better job opportunities and who have longer work lives over which to enjoy the returns to search. *Years of work experience* with a particular firm is also negatively related to search. The longer a worker's tenure, the greater is the accumulation of firm-specific, on-the-job traning that would be lost by job switching.

Other sources of individual heterogeneity have been examined. For example, the *number of school-age children* decreases the likelihood of search, probably because of the increasing risk aversion associated with the number of dependents. A *desire for more work hours* than available on the current job has been found to motivate search. Similarly, *multiple job* holders are more likely to be looking for other jobs as they attempt adjust or consolidate their work hours and reduce fixed work-related expenses through consolidating jobs.

C. IMPLICATIONS OF JOB MOBILITY AND GEOGRAPHIC MIGRATION

The importance of obtaining estimates of the pecuniary effects of *job mobility* is underscored by the enormous number of annual job changes. For example, there were 69 million persons employed in both January 1972 and 1973, and according to Byrne (1975), 14.3 percent or 9.9 million of them changed employers during the one-year period. Mattila (1974) reports that during 1961, almost 3 million workers accounted for 4.3 million quits. Mattila also notes that 50 to 60 percent of quitters were able to switch jobs without intervening unemployment, which suggests both the efficiency and the widespread occurence of on-the-job search. Yet, there is comparatively little evidence on the productivity of acquiring information and/or job offers.

Several analyses using the NLS of older men (age 45-59) have estimated a positive rate of return to quit activity. The findings are in close agreement, although this is not surprising given the coincidence of samples and time frames: Bartel and Borjas (1977) and Mellow (1977) find that quits occuring between the 1966-67 interviews have a positive and significant effect on short-run changes in wage rates (1966-69 and 1966-67, respectively). Flanagan (1974) estimates a signifcant positive rate of return to 1966-67 job instability on 1966-67 wage change for older males, although the results are insignificant for the NLS younger male sample. Bartel and Borjas also find that quits significantly affected 1966-69 wage growth only for workers who indicated they had found new jobs before quitting their old jobs.

Black (1980b) uses longitudinal data from the Michigan Panel Study to extend the above model by analyzing the short-run wage effects of job quits in several respects. First, voluntary labor mobility is specified to include on-the-job search (OJS) as well as quit events in order to reflect more accurately the concept of mobility described by search theory

(Burdett, 1978; Barron and McCafferty, 1977). He finds that the wage repercussions of quitting are significantly influenced by search. Workers who quit without prior OJS not only experience a smaller change in wage rates than similar quitters who do search, on average, but they appear less able to exploit existing market wage opportunities by switching firms than if OJS had been pursued.

Second, Black incorporates a key implication of search theory into the empirical specification. Recent theoretical models are quite explicit in deriving a necessary optimality condition for undertaking search and/or quit activity: the exepected wage rate to be elicited from search must exceed a worker's acceptance wage. The implications of whether or not this condition is satisfied by workers who report search and quit activity are examined and the estimates suggest that the returns to quitting are significantly circumscribed by exploitable market wage opportunities specific to workers' skills. Third, the results also indicate that previous findings of a positive return to quits may be specific to the tightness of the 1966-69 labor market and may be inappropriate in a slack market.

Barron and Mellow (1978) investigate labor force transition probabilities arising from individual search choices while unemployed. They use matched data from the May and June 1976 Current Population Surveys. Search effort, as measured by the number of hours searched per week, increases the probability of an unemployed worker obtaining employment. Conversely, a higher acceptance wage standard relative to an imputed market wage reduces the employment probability. Receipt of UI benefits reduces the likelihood of re-employment but tends to keep workers in the labor force rather than dropping out.

Geographic mobility is another avenue by which workers are able to enhance their earnings, usually in conjunction with a change in employers (intrafirm transfers is another source of location change). The empirical evidence that has recently accumulated suggests that the monetary returns to migration vary significantly with respect to (1) the type or distance of the move, (2) for whom the change in earnings is measured, and (3) the last move.

Polachek and Horvath (1977), using the PSID data on white, husband-wife families, find that interstate moves are associated with a net increase in earnings for movers vis-a-vis similar nonmovers, while local moves do not lead to such relative increases. A likely explanation behind this difference is that longer-distance moves tend to be associated with job changes while local moves, on the other hand, are usually not prompted by such incentives.

Polachek and Horvath, along with Mincer (1978) and Sandell (1977), find that the monetary effects of migration for husband-wife households differ considerably by whether the focus is family, husband, or wife earnings. In general, the change in family income is positive, although not always statistically significant for movers compared to similar nonmovers. However, the change in husband earnings is invariably large and significant, while that of the wife is significantly negative.

The hypothesis behind these contrasting effects is that wives tend to be "tied" movers in the sense that family job location decisions seem to be dominated by the husband's job search. This does not imply that a wife's employment opportunities are not considered in a family's location decision. In fact, Sandell (1977) and DaVanzo (1978) have found that the likelihood of a move is significantly determined by the strength of a wife's labor force attachment and the size of her contribution to the family's income.

While the family decision may jointly consider husband and wife job oppotunities, a more likely pattern is a sequential one where the job-location choice is made first by the husband, and then by the wife. As a consequence, wives tend to be constrained to look and work in an area that offers less favorable emloyment matches for their skills than if they had made their decisions independently.

Frank (1978) finds evidence that dual-career households are more likely to move to larger labor markets which are better able to offer jobs to both heads in the areas of their interests. Sandell (1977) examines the loss in wife's earnings more closely and finds that the key variable affecting the relative drop in earnings is the reduction in work hours, as opposed to a reduction in wage rate received if employed. The difference in weeks worked between migrant and nonmigrant wives may be due to re-employment problems and/or efforts to set up a new household.

Sandell (1977) also finds that the earnings impact for wives, as well as husbands, is importantly influenced by the elapsed time since the change in location. With respect to wife's earning, the negative impact of migration is evident only during the first two years following a move, thereafter becoming slightly positive and insignificant. For husbands, a similar trend is present where the large positive returns are estimated to occur only after two years in the new location. Polachek and Horvath (1977) also estimate such a time effect for the change in husband and family earnings. There appears to be a substantial post-move adjustment process that not only includes the often delayed entrance of the wife into employment, but also the steeper wage growth rates among husbands of migrating families.

D. LESSONS FOR FURTHER RESEARCH

We now must ask the question of what are the more important limitations of past analyses; in particular, which ones can we hope to remedy in our own analysis? The job search and geographic mobility literatures have evolved separately although some of the recent migration analysis implies that there is a connection between the two. First, the employment status of both the husband and wife appear to influence the incidence of migration. Dissatisfaction with one's job, manifested by search activity, is also associated with a greater chance of moving. Second, the pecuniary outcome of migration is linked to the distance of a move, the employment of the wife in the destination location, and the passage of time after relocating.

Our analysis will devote greater attention in modeling explicitly the job search-location choice decisions in order to better understand the linkage between the two. Particular emphasis should be given to the effect of different methods of search activities for both the occurrence of a job/location change and their subsequent earnings effects. The unemployment status should be more carefully investigated to estimate the respective impact by the cause of not working (e.g., quit, laidoff, new entrant), the length of the current unemployment spell, and the number of past spells of joblessness. An effort should be made to discern the extent to which jobs are found before moving, rather than after migrating. In addition to the employment and earnings effect of job/location mobility, some attention should be given to their nonpecuniary repercussions.

The work done thus far has focused primarily on white, intact, husband-wife families. Clearly, other population subgroups must be analyzed. In particular, there has been little work on young workers entering the labor force and the role of job/location mobility as an integral part of this process. Little is known about the occurrence of job search, its ties to job and location changes, and their respective interactive effects on subsequent labor market outcomes.

There is a strong consensus, based on the studies reviewed above, that two of the most important predictors of search and migration are age and educational attainment. These variables will be essentially held constant in a study such as ours which concentrates on a cohort of recent high school graduates. Furthermore, a third crucial predictor of migration--the number of past moves--may not play as important a role in our sample that is essentially just embarking as independent households.

In terms of explaining sample variation, we are thus at a disadvantage because age, years of education, and migration experience are roughly constant for the subgroup that is being analyzed. Yet, it is essential to understand the causes behind the early labor market successes and failures if policymakers are to identify areas of public intervention that have the potential for enhancing the job-worker matching process.

With respect to the role of education, the literature is quite clear in identifying the level of formal education as a significant predictor of both job search and migration. A glaring omission is that nothing in the literature indicates what aspects of an individual's education experience are relevant to search and migration. This study will devote particular attention to the institutional parameters of the high school system and the individual's performance within it in order to gain insight into this neglected area of the education experience.

CHAPTER IV

GEOGRAPHIC AND LABOR MARKET MOBILITY: A CONCEPTUAL FRAMEWORK

A fundamental premise of migration and labor market mobility studies is that households act in a manner designed to make themselves better off. That is, they behave in a rational fashion attempting to enhance their sense of well-being, defined generally as household satisfaction or utility, or more narrowly as household income. While there are a number of ways in which a household might increase its utility or income, this research concentrates exclusively on job search and migration as the means for improving socioeconomic status. In what follows, a rather simple model of household decision-making is developed in order to provide a conceptual framework for the analysis and a basis for interpreting the empirical findings and making policy recommendations.

A significant distinction between this and other analyses is that we explicitly model the joint decision to migrate and to change jobs. Heretofore, both activities have been analyzed separately in spite of the tie between the two. Although the impacts of initial labor force status on migration, and vice versa, have been examined, there has been little attention devoted to the joint occurrence of geographic and labor market mobility. This broader focus is particularly relevant for young workers because they exhibit substantially greater job and location mobility than older workers. The nexus between both types of mobility is documented by Bartel (1977), who reports that 85 percent of the young men cohort of the National Longitudinal Surveys (aged 19 to 29) who moved between 1971 and 1973, did so for economic reasons (i.e., predominantly job-related moves). However, it should be noted that only a fraction of job changers are also migrants, so that local and distant job changes could be viewed as competing alternatives.

The link between job change and location change is also underscored by the policy importance placed on youth employment. To improve the economic status of youth, it is important to understand how young workers locate and retain (good paying) jobs. This policy orientation serves as the driving force behind this research. To operationalize the analysis, we formulte a decision-making model based on labor income maximization. That is, we asume that a household makes it's job/location change decision so as to increase the combined earnings of its members. This focus on labor earnings serves to highlight the policy goals of gaining insight into behavior that affects the financial self-sufficiency of young workers. As implied by Bartel (1977), abstracting from nonjob related motives will not result in much loss in generality.

The assumed maximization of labor income rather than utility also reduces the expositional complexity. Formally, we could "monetize" nonwage remuneration, leisure activities, and environmental elements and subsume them under a full income measure. Although this is analytically complete, this strategem essentially avoids the question of how the theoretical predictions might differ if nonmonetary factors were considered separately. The empirical chapter also details how we define and include nonmonetary factors in the estimation.

The unit of analysis is the individual who seeks to maximize household earnings. Of course, for single persons living alone there is no distinction between maximizing household versus individual income. But for married persons (which includes unmarried partners), the distinction is important because a decision to migrate may affect the earnings of the spouse, while a decision to change jobs locally does not have such an effect. If the spouse is unable or does not want to work, then geographic shifts should be influenced primarily by the individual's earning status. The essence of our analytic framework, then, is that an individual's mobility decision takes into account the impact of job/location changes on household rather than one's personal income.

Mobility presumably yields benefits to the household undertaking a job/location change. But, it also requires expenditures, both direct (out of pocket) expenses and opportunity costs (foregone work time between jobs). Because mobility is associated with both benefits and costs, it is reasonable to assume that individuals base their decisions to move on an evaluation of the benefits and costs to their respective households in undertaking such changes. From this perspective, geographic and/or labor market mobility can be considered an investment decision where the expected costs of investing in a productive activity are weighed against the expected returns.

In our framework, job change and/or location change are options available to a household. For a typical household, the net advantage of moving from the "jth" job-location to the "kth" job-location destination is calculated by the net gain in household income $Y_k - Y_j$ less the total cost of relocating from j to k, C_{jk}. A positive difference, $Y_k-(Y_j + C_{jk}) > 0$, would suggest that a contemplated change in the job-location combination is worthwhile.

There are several additional considerations, however, that must be incorporated into the investment decision. First, benefits, and to a lesser extent costs, may accrue over time. The measurement of income and costs must reflect their temporal patterns. For example, a small net benefit to migration in the first time period may become a very large gain if the net benefit persists over time. Hence, the measurement must sum together the incomes and costs that accrue in each future time period. Second, households do not work or live forever so that flows of benefits over time must stop eventually. The retirement age (often set arbitrarily at age 65) is often used as the endpoint because earned income usually drops to nearly zero at that age.

Third, future benefits and costs are not valued as highly as the same amounts received today. Thus, future receipts and expenses should be deflated or discounted more heavily, the further from the present time is their occurrence. The method of discounting is to weight each time period's benefit and cost by $(1 + r)^{-t}$ where r is the rate of discount (often set equal to the average market interest rate per period). The value of the exponent, t, depends on the period of accrual. The greater is an individual's preference for current rather than future income reciepts, the smaller is the discounted value of any future benefit or cost. An additional source of discounting stems from the lack of confidence with which individuals are able to forecast their future incomes. Because earnings streams are not perfectly auto-correlated, households should attach a risk factor to further deflate future income flows. The effect of combining the rate of time preference with the risk premium is that the effective planning horizon (beyond which earnings are discounted effectively to zero), is much shorter than the remaining years of worklife implied by the retirement age for young workers. Friedman (1957) has argued that three years is an appropriate planning horizon for making consumption/saving decisions, and the same may be hypothesized to apply for labor supply decisions.

A fourth complication is that individuals are presumed to evaluate all possible job-location destinations before deciding whether to move, and if so, where to move. This implies that the investment decision is based on comparing the best available destination with the origin job-location. The above discussion can be expressed more compactly by an investment rule: A job-location change is worthwhile if the present value (PV) of the net benefits is positive. If so, then a move from j to k should be made.

$$PV_{jk} = \sum_{t=0}^{T} \frac{(Y_{kt} - Y_{jt})}{(1 + r)^{t}} - \sum_{t=0}^{T} \frac{C_{jk}t}{(1 + r)^{t}} \quad \text{for } j \neq k. \qquad (1)$$

The present value equals the difference between the discounted increase in household labor income over time and the discounted household costs of moving. If for some $PV_{jk} > 0$, then a move is made to the job-location combination associated with the highest PV_{jk}.

The investment rule lies behind the intuitive notion that mobility occurs if it is deemed worthwhile by a household. From equation (1), we can predict that individuals with a longer time horizon (T) are more likely to move because the net gains are summed over a longer span of time, while the costs are usually incurred in only the first couple of years. Similarly, a lower rate of time preference (r) will result in a larger present value for a given value of $(Y_k - Y_j)$. If job change or migration results in a long spell of unemployment for a household member previously employed at the point of origin, then the change in income will be smaller and possibly negative until reemployment occurs. If households move from low wage to high wage areas, then the implied income difference $(Y_k - Y_j)$, will be larger.

Items included in migration costs, C, are the expenses incurred in looking for another job and/or residence, direct or actual outlays such as transportation, the temporary loss of friends, costs of maintaining personal ties, transactions costs if a house sale is necessary, and the temporary decrease in psychic value due to leaving familiar surroundings. In some cases, the greater the geographic distance between j and k, the higher the costs. In other instances, costs remain fixed regardless of distance. As implied by the present value formulation, the opportunity cost of foregone income lost because of a move (e.g., travel time, unemployment between jobs), is included in $(Y_{kt} - Y_{jt})$.

A point which should be emphasized is that migration and job change are not necessarily once and for all events. In fact, a consistent empirical finding is that persons are more likely to migrate and change jobs, the more times they have done so in the recent past. Part of this phenomenon may be due to poor information and/or incorrect assessment of prevailing opportunities. Past mistakes may then encourage subsequent moves as households attempt to correct their situation. In addition, multiple moves may be idiosyncratic to households or part of a longer run strategy that requires several job-location changes over time. Regardless of the causes, we are unable to account for the way in which households incorporate future moves into their current mobility decisions. Hence, we must assume throughout that a decision is made as if it were a once and for all choice.

The above discussion suggests a deterministic framework in which a household automatically moves when it faces a positive PV_{jk}. Thereafter, it remains in the k^{th} location until a change occurs in one of the underlying parameters that influence the value of the current job-location vis-a-vis alternative combinations. In other words, a post-move equilibrium will persist until changes occur in the future. However, an equilibrium condition may not exist for recent labor force entrants for two reasons. First, workers in general, and youth in particular, have access to labor market information that is both imperfect and costly to acquire. Second, due to major economic changes encountered by high school graduates, their geographic location upon graduating may be suboptimal.

The above suggests that even in a stationary world, some job-location movement is expected among recent high school graduates. Because of labor market imperfections, however, individuals must seek out relevant job information and/or offers. This implies that a forthcoming job-location change is unknown because of the uncertainty surrounding the whereabouts, timing, and particulars of any given job offer. Thus, a stochastic element must be injected into the mobility model to reflect this aspect of reality. Because job search requires time and may be unsuccessful, the returns to a job-location change must be weighted by the likelihood of its occurrence. This results in an expected value where the income associated with a particular job-location combination is deflated by an individual's appraisal of how achievable it is.

Imperfect information also implies that for a given type of worker and labor market condition, a distribution of wages exist rather than a single market wage. Although classical theory predicts, that in general, a worker cannot affect his or her earnings, the existence of inadequate information and consequently, the variation in wage rates for workers with the same level of skills, suggests that individuals are able to influence their income via job search. Hence, when workers evaluate the possible returns to mobility, they base their decisions on expected earnings, given prevailing wage distributions and the nature of their job hunt.

Although individuals are unable to influence the *distribution* of wage offers relevant to their skills, they are able to affect partially the number and timing of *offers*. If search can be characterized as a random process of sampling firms, then the greater the number of inquiries per period, the more likely is an acceptable offer to be elicited within a given time period. In addition, the flow and value of wage offers are influenced by search methods and the geographic scope of the job hunt.

A second aspect of search behavior that influences both the returns to search and the duration of search is the acceptance standard which an offer must exceed before it is deemed acceptable by a job hunter. The higher the minimum acceptance wage set by a searcher, the longer is the search process, but the higher are the returns. Because of these offsetting effects and the associated benefits and costs, it is necessary to derive optimal search policies regarding these techniques (see the literature review in Chapter III for discussion).

Incorporating the stochastic nature of search and mobility into the present value rule noted in equation (1) results in:

$$E(PV_{jk}) = Q \cdot \sum_{t=0}^{T} \frac{(Y^*_{kt} - Y_{jt})}{(1 + r)^t} - Q \sum_{t=0}^{T} \frac{C_{jkt}}{(1 + r)^t} - SC. \qquad (2)$$

Equation (2) no longer depicts the certain or known present value of mobility. Rather, (2) expresses the expected present value, E(PV), which equals the net expected gains to mobility, weighted by the chance Q, that a job offer will materialize in location k, less the certain costs incurred by searching, SC, for other job-location pairs during t.

From equation (2), it is evident that the individual has some control over the expected benefits and costs associated with mobility. First the likelihood of obtaining or finding a suitable job-location pair is a function of both the intensity, type and range of search, and the stringency of the job acceptance standard. Second, the costs of search, money and time spent looking, are directly controllable by the search strategy pursued.

Third, the wage income expected to result from search, Y^*_k, is affected by the acceptance wage set by the individual, Wa. A higher Wa results in a higher Y^*_k, but also a lower probability of finding an acceptable job since fewer offers are likely to exceed Wa. Search models summarized in the literature review explain how assumptions about the probability density function generating job offers are used to derive an optimal Wa.

The geographic scope of job search has received little attention with the exception of David (1974) and Seater (1979). This feature is especially relevant to our analysis because the spatial element of search is the key link between job mobility and migration. Job search literature is generally modeled within a single labor market where the spatial nature of different labor markets is not addressed. Similarly, the geographic scope of search is rarely mentioned.

The most obvious motivation behind the decision to extend one's job search beyond the local labor market is that a wider search is more likely to elicit additional and/or better job offers. Casting a wider net is especially appropriate when overall local labor market conditions are poor relative to those in other areas--a disadvantage that implies a smaller probability of obtaining a (better paying) job. Another reason for searching in several geographic areas is that the effective labor market for a category of worker may be at the regional or even national level. Stated somewhat differently, the local demand for specialized types may be relatively low, requiring a wider scope of search.

A wider radius of search does not necessarily imply a higher expected return to search. The result of extending the geographic scope partly hinges on the technology of search, the costs, and the concurrent changes in search intensity and/or methods. It is unclear whether or not the same number of job inquiries extended over a wider area will enhance the prospects of a greater return over the return associated with a more geographically focused search. The outcome largely depends on market conditions and the type of search behavior. On the one hand, if the probability of success per inquiry is independent of search intensity, then an extension such as above is likely to increase costs and not affect benefits. But on the other hand, if there are either few employment opportunities in each area or if search is not random but begins with the most promising firms and works downward, then a geographic extension may provide net benefits.

Explicit consideration of job search across several labor markets is necessary in order to establish a formal link between job and geographic mobility. However, it is difficult to specify *a priori* a definite temporal sequence among search, migration, and job change because the sequence of activities may vary substantially from one individual to another. Employed workers may quit their jobs either before or after conducting search and may or may not have a job lined up before quitting, regardless of their prior search. Search may precede migration or may occur after moving to a new area. Search may or may not encompass local and more distant labor markets. Job change does not necessarily require migration, while migration (except for transfers) is associated with a job change. And finally, unemployment may describe a worker's labor force status before, during, and after migration.

To facilitate drawing implications from the conceptual framework, the above discussion is expressed in a more compact mathematical representation. The following expression for a single person's expected value of labor earnings explicitly denotes the potential income to be earned in the best alternative location, Y^*_m, and the potential earnings to be earned from another job located in the initial area, Y^*_1. The probabilities of obtaining such a job in the best alternate and current locations are, respectively, Q_m and Q_ℓ. The respective search costs and job/location expenses are SC_m, SC_ℓ and C_m, C_ℓ. To avoid further encumbering the notation, we focus exclusively on a single person. This will be followed by a discussion of a married couple using more general notation.

Assume that an individual entering time period t=0 is faced with a decision of whether or not to look for a (new) job during t=0. This decision is linked to several aspects of search including whether to look only locally or to consider alternative areas, the intensity and type of search to conduct, and the acceptance wage to set. The search policy followed, if search is undertaken, affects the likelihood of finding an acceptable job. A search policy also implies that costs are incurred, and in the event of a local or long-distance job change, there are relocation expenses. We assume that an individual is either working ($Y_t > 0$) or not working ($Y_t = 0$) during t=0, and expects to continue receiving Y_t with certainty over the remainder of the planning horizon. Because workers are concerned with the stream of earnings over time, income must be appropriately summed and discounted back to the present period. Hence, the expected present value is:

$$PV_o = Q_m \sum_{t=0}^{T} (Y^*_{tm} - Y_t)(1 + r)^{-t} + Q_\ell \sum_{t=0}^{T} (Y^*_{t\ell} - Y_t)(1_t + r)^{-t}$$

$$+ \sum_{t=0}^{T} Y_t \, (1 + r)^{-2} - (SC_{t\ell} + SC_{tm} + Q_\ell C_\ell + Q_m C_m). \qquad (3)$$

The first two terms on the right-hand side indicate the potential gains that might be realized by a job-location change and by only a local job change. The third term represents the worker's current income, which is expected to be received with certainty. The latter terms summarize the relevant costs, where the expenses of mobility are weighted by the likelihood of such a move occurring. The $Y_{\ell,m}$ are the best wage offers that a worker expects to elicit, given the acceptance standard and the distribution of wages for which he or she is qualified.

The economic problem facing a worker entering t=0 is how to maximize V by manipulating the following search variables at his or her disposal: the acceptance wage rate (Wa), the choice of labor markets in which to search (LM), the number of search hours per period (SH), and the search methods to use (SM). The maximization is subject to:

$$Y_{\ell,m} = Y(Wa, LM, SH; K, U_{\ell,m}) \quad (4)$$

$$Q_{\ell,m} = q(Wa, LM, SH, SM; K, U_{\ell,m}) \quad (5)$$

where

K: Search ability and work skills
U: Labor market conditions.

Equations (4) and (5), formalize the notion that a worker is able to influence the expected present value of earnings by the selection of a search policy. The probable impact of search on PV, however, is partially governed by an individual's current endowment of human capital (K) and the prevailing economic conditions on the current alternative labor markets (U). The decision of whether or not to undertake job search and which labor markets to consider can be described as a choice among three alternatives: no search (n), search only in the current or local market (ℓ), and search in other more distant markets (m). The expected present values associated with each of these choices are:

$$V_n = \sum_{t=0}^{T} Y_t (1 + r)^{-t} \quad (6)$$

$$V_\ell = \sum_{t=0}^{T} Y_t (1 + r)^{-t} + \sum_{t=0}^{T} (Y^*_{t\ell} - Y^t (1 + r)^{-t} - (SC_{t\ell} + Q_\ell C_\ell) \quad (7)$$

$$V_m = \sum_{t=0}^{T} Y_t (1 + r)^{-t} + \sum_{t=0}^{T} (Y^*_{tm} - Y_t)(1 + r)^{-t} - (SC_{tm} + Q_m C_m) \quad (8)$$

The expected values for V_ℓ and V_n are based on the optimal search strategy devised by a potential searcher. Mathematically, this is done with calculus by deriving first and second-order conditions with respect to each of the search policy variables. Given the optimal values, if a potential searcher were to pursue each policy, then expected values of $Y_{\ell,m}$ and $Q_{\ell,m}$ could be determined, thus permitting calculation of V_ℓ and V_m. The optimal search strategy thus derived would provide a set of necessary conditions that must be followed, theoretically, for search to lead to a maximization of PV in equation (3).

Given the optimal search policy and the associated present values in (6-8), a sufficient condition for deciding whether or not, and where, to search is based on a comparison of V_n, V_ℓ, and V_m:

$$\text{Search Decision} = f\ [\text{MAX}\ V_n,\ V_\ell, V_m] \quad (9)$$

If $V_n > V_\ell, V_m$, then search is not warranted. If $V_\ell > V_n$, V_m, then search within the local area is worthwhile. If $V_m > V_\ell, V_n$, then search in other labor markets is the most attractive decision.

The above decision is equivalent to the earlier investment rule which specifies that search should be undertaken if the benefits exceed the costs of looking and the costs of relocation. For example, the decision to search locally versus not to search at all is based on whether or not $V_\ell - V_n > 0$. Subtracting equation (6) from equation (7) yields the decision rule for local search:

Local Search if $V_\ell - V_n > 0$, or

$$\sum_{t=0}^{T} (Y^{*}_{t,\ell} - Y_t)(1 + r)^{-t} - (SC_{t\ell} + Q_{\ell} C_{\ell}) > 0. \qquad (10)$$

An analogous rule exists for distant search versus no search. The model is also consistent with local versus distant job search, (for simplicity, we have treated the decision to search as a discrete rather than a continuous phenomenon).

Note, however, that job and location mobility are not automatically forthcoming if a worker engages in job search. Because the outcome of search is uncertain, the above present values are necessarily expected values. The likelihood of a job/location move, denoted by the probability of a successful search, Q_{ℓ} or Q_n, is less than unity which suggests that even if mobility is economically warranted, it may not occur because of the stochastic phenomenon that is being investigated. Finally, we would expect that search in more distant labor markets will, if successful, lead to a move to the best alternative labor market. The latter event is a function of both the wage offers in other locations and the associated probability of eliciting acceptable offers.

From the above discussion, several observations can be made. First, if a worker is unemployed in t=0, Y_t =0, then the potential gain to local and distant job search should be greater since zero earnings are expected to persist over time. Hence, unemployed workers should be more likely to search and to move for a job than similar workers who are initially employed. Second, factors that raise the costs of either search or mobility will in turn reduce the incentive to undertake search and, subsequently, to move.

Third, relatively propitious labor markets in other locations (e.g., low unemployment rates), will increase the probability of mobility. Fourth, persons better skilled at search (ability to acquire and assess information), should be more likely to engage in search/mobility than comparable workers who are not so well endowed. Fifth, greater liquid assets should permit a greater time/dollar investment in search and migration, thereby increasing the chances of a move. Sixth, the higher are current earnings, the lower is the potential net return to search/mobility than comparable workers with poorer jobs, and hence, the probablity of either occurring. Seventh, the receipt of income-conditioned transfers effectively subsidizes the cost of remaining (partially) unemployed, thus reducing the incentive to search or relocate.

Finally, the net returns to search and mobility are influenced by the set of search policies used, and a strictly random component imbedded in the stochastic terms. The optimal level and mix of search activity (e.g., geographic scope, intensity, methods) are determined by adjusting each until their respective marginal benefits and costs are equated to one another. Factors that cause $Y^*_m > Y^*_\ell$, and/or $Q_m > Q_\ell$ will encourage greater search in alternative locations. An analogous interpretation holds for search and mobility costs associated with longer versus shorter distance job-location changes.

The family context is now considered for married persons. In this more encompassing framework, the individual decision-maker is assumed to maximize household income, which equals the sum of husband (H) and wife (W) earnings. Although we do not apply the analysis to the spouse, it is assumed that a married person considers the immplications of migration on spouse earnings (other family member earnings are ignored because of the youthful sample). Using the same terminology as before, the objective function becomes the present value of expected family (F) earnings:

$$V(F) = V(H) + V(W). \qquad (11)$$

The respective present values for the three activities considered in equations (6-8) (no change in job-locations status, local job change, combined job-location change) can be summarized sucinctinly as:

$$V_Z (F) = V_z(H) + V_z(W) \quad \text{for } Z=0,\ell,m. \qquad (12)$$

The $V_Z(F)$ enter into the decision-making function.

$$\text{Search Decision} = f\left\{\text{MAX } [V_n(F), V_\ell (F), V_m(F)]\right\}. \qquad (13)$$

While the analytical framework has remained the same, the search decision, and subsequently the likelihood of making either a local or more distant job change, is now a function of family rather than individual expected earnings over time. In this analysis, we abstract from the interdependence between the decision to work and the number of desired work hours. Instead, we focus only on labor market and geographic mobility, taking as given the intra-family decisions regarding employment and hours. This focus, however, does not preclude analyzing migration as a means for improving the chances of obtaining employment.

Because a married person's decision to change job/locations may affect spouse earnings, we expect the mobility behavior of individuals to vary by marital status. This is particularly true if the net gains are of opposite signs for the husband and wife since this would reduce the family returns to mobility. However, if both spouses gain from mobility, or if one spouse remains unaffected by mobility (in general this implies remaining jobless), then marital status should not have a job-related impact on husband-wife behavior.

In some cases, families may migrate even though the husband's V_m and wife's V_m differ in sign. This is because one spouse's V_m is sufficiently large to offset the negative V_m of the other so that $V_m(F) > V_n(F)$, $V_f(F)$. The spouse with a negative V_m has been labeled by Mincer (1978) as a "tied mover". That is, he or she is one who moves even though his/her individual calculations imply staying. Similarly, there may be "tied stayes," or those whose potential returns to migration are dominated by the spouse's losses, which implies $V_n(F) > V_m(F)$.

The deterrence effect of marriage is most applicable to migration since the latter usually forces a change in jobs for an initially employed worker and also implies a change in the probability of finding a job as well as the type/level of remuneration. Marriage may also influence local job mobility. For young couples and those without children, one income may provide enough support to enable a nonworking spouse to search for a better job. An employed spouse may also reduce the consequences of lost family income associated with risky ventures such as job quitting. Hence, greater voluntary job mobility and/or longer periods of unemployment are anticipated as a spouse's earnings increase.

Changes in marital status are expected to affect migration decisions. According to the above framework, divorce should lead to greater geographic mobility as previously "tied stayers/movers" are no longer dominated by the spouse's potential gains. Newly married persons may be more likely to relocate for nonjob reasons (move away from home) but the above would suggest a reduced incentive to migrate, especially if both spouses have independently moved to the premarriage location.

In closing, we should stress that the behavior predicted by the income maximization framework will also be a function of nonpecuniary considerations. The level and mix of nonwage remuneration (e.g., fringe benefits, working conditions, on-the-job training, advancement potential) are potentially important causes of job mobility. Similarly, environmental factors (social, institutional, physical) may prompt household migration. Failure to take some account of these elements will limit our ability to explain empirically the determinants of mobility. For example, relatively low wages in an area may be expected to induce out-migration. Yet, if that area has offsetting physical amenities, then we would expect fewer moves. To the extent that the available data permit, the empirical analysis will control for these nonjob factors. However, the goal of income maximization is assumed here to be the key motivating force behind labor market and geographic mobility.

CHAPTER V

YOUTH MIGRATION: EMPIRICAL ANALYSIS OF ITS DETERMINANTS

A. INTRODUCTION

The previous chapter developed a decision-making model of job-location mobility which provides a theoretical framework for estimating the determinants of both activities. The empirical analysis presented in this chapter applies the general model to the more specific phenemenon of youth migration. Chapter VI represents the second part of the migration study in its examination of the labor market outcomes of migration.

Migration is an important phenomenon, both for the socioeconomic well-being of individual households and also for society at large. Presumably, households move in order to improve their financial and/or nonfinancial status, thereby improving the overall functioning of the economy. Of particular concern to researchers and policy makers is the responsiveness of households to labor market signals. In order for the economy to function most efficiently, it is crucial that human resources be allocated to their best uses. Migration is a key element in attaining an efficient allocation as human resources move from low-productivity, low opportunity areas to locations offering more favorable job conditions. The economy-wide gain from this process has, as its micro counterpart, an increase in household labor income as individuals move to areas making better use of their productive talents.

The extent to which workers recognize and respond to market signals has stimulated considerable inquiry among economists. Unfortunately, recent research has generally not focused on the geographic mobility of youth, in spite of the fact that young persons have the highest rates of job and location mobility in the U.S. population. Superimposed on the heightened mobility of youth and the general lack of knowledge concerning it, is the school-to-work transition that is so critical for today's youth. Research has focused primarily on the insufficient quality/quantity of formal schooling, the lack of skills directly applicable to work, disadvantaged family and neighborhood backgrounds, discrimination, poor job placment and dead-end, low-paying jobs to which young workers are often relegated. Relatively little analysis, however, has focused on the mechanisms by which young persons enter the labor market and find employment through their job search efforts and/or decisions to migrate.

If migration is an effective means for youth to secure (better) employment, then one is led to ask what factors encourage or discourage such movement. In what follows, we attempt to answer this question. The NCES longitudinal data set provides an excellent opportunity to scrutinze the causes of migration. Because the panel data were gathered over several interviews, we are able to divide the roughly four and one-half year period encompassed by the data into two segments: (1) The spring of the sample's senior year in high school (1972) to October 1974, and (2) October 1974 to October 1976.[1] This enables us to examine two quite different stages in a person's post-secondary career as a young adult. The first stage, the two and one-half years immediately following graduation, commonly marks the beginning of a young person's life as a decision-maker independent of parental control as well as the beginning of economic self-sufficiency. To the extent this occurs, we would expect recent high school graduates to seek employment and/or move out of the parents' home to a neighboring or distant residence. Of course, not all graduates "leave the nest", and it is partly this ignorance of who moves and why, that has motivated this study. There are a number of reasons to anticipate relatively greater rates of migration right after graduation than in later years. To begin with, graduates may find that their high school location (presumably chosen by the parents) is relatively disadvantageous as they seek employment. Noneconomic factors such as climate and social activity may also prompt location changes. Put differently, the high school location represents a disequilibrium position for many graduates which is enforced by the individual's status of student and family dependent. Released from both of these constraints, many graduates are quick to remedy their condition of disequilibrium by migrating. Others, of course, may not move at all; others may first test the local labor market and move only if they are unsuccessful (e.g., no job, or low pay). Other factors such as marriage, ability to finance a move, degree of perceptivenes of labor market opportunities and ability to acquire and access information on jobs in other locations will also influence the likelihood of moving. In addition, the type of high school and the individual's performance as a student may provide an explanation of what governs a decision to migrate.

The second analysis period enables us to examine how an individual's post-high school experiences influence subsequent migration. Significant life-style changes occur during a person's first few years upon graduation. Marriages occur, children are born, jobs are found and lost, financial independence is established, and further education and training acquired. Hence, the second time period provides an opportunity to estimate the impact on migration of a whole new set of factors, as well as investigate how the influence of earlier variables changes over time.

Finally, we are able to examine the influence of mobility that occurred in the first analysis period on the likelihood of migrating again in the second period. The latter phenomenon is a widely observed demographic occurrence and it is important to see if such a pattern is discernible at such an early stage in an individual's adult life.

The results of the empirical work represent an important step in acquiring a better understanding of youth migration. The estimates indicate that the probability of a long-distance move is significantly related to a number of variables that include local economic conditions, the high school environment, background factors, marital status, labor force status, and past migration itself. In what follows, the sample and descriptive statistics are described in section B, the dependent variable and estimation technique are defined in section C, the estimated results are presented and intepreted in sections D and E, and the final section summarizes the empirical analysis.

B. SAMPLE AND DESCRIPTIVE STATISTICS

1. Sample

The focus of this research is the geographic mobility of recent high school graduates. Because of the overriding policy concern with the mechanics of the school-work transition, the analysis is oriented toward nonstudents and nonmilitary personnel. The latter tend to move for noneconomic considerations - to attend a particular school, assignment to another military base. The principal goal of this part of the analysis is to discern how and why persons distribute themselves geographically without the constraining influences of their usually short-term careers as students and military personnel.

All members of the sample had to have graduated from high school no later than September of 1972 (normal graduation being in May and June 1972). The NCES survey was not designed to focus on high school dropouts, and the few who were initially interviewed in the spring of their senior year but then failed to graduate were excluded from the sample. In contrast, there were many graduates who continued with their formal education. Those who graduated from four year colleges, however, are not investigated because the time frame of the NCES longitudinal file does not permit a sufficiently long enough period following college graduation to examine their migration behavior.

The second analysis period (October 1974 to October 1976), does include persons who acquired postsecondary education and training up through September 1974. Those who were enrolled in school during the month of October 1974, however, are excluded from the analysis. The student-military filters for the first analysis period are applied as of October 1972. While this date does not coincide precisely with the starting point of that time period, it is nevertheless a reasonable compromise given the nature of the summer recess phenomenon associated with most educational programs.

The reason that the sample is selected on the basis of beginning period student-military status is that we are interested in the predictive capability of the model. The analysis is intended to estimate the determinants of migration for high school graduates who are initially not in school and not in the military. If these results are used to predict future mobility, we cannot impose sample restrictions that require future information. Similarly, the explanatory variables used to predict the occurrence of migration are measured either at the beginning of each time period, or from earlier survey data. The important point is that future information is not used to predict future events.[2]

Finally, the sample is further reduced by eliminating cases with missing responses to survey questions used in the analysis. A major cause of missing response was that over 5,000 persons missed the 1972 survey. Although some of the base-year information was obtained from retrospective questions asked in the 1973 survey, there were no questions asked regarding two key predictive variables - aptitude and years of residence in the high school location. Fortunately, the size of the NCES sample is sufficiently large to provide a sample that is still big by most research standards.

2. Sample Stratifications

The sample of high school graduates is stratified or split into subsamples for the purpose of estimating the empirical model. For the first period, the sample is split into male respondents and female respondents. For the second period of analysis, the sample is split into three groups: married male respondents, married female respondents, and all single persons. There are several reasons for decomposing the sample by sex and marital status. First, males and females may have different occupational aspirations and geographic preferences that would influence their responses to changes in explanatory variables. Sex discrimination as well as family plans may also affect location decisions. Second, single persons generally do not have to consider the benefits and costs to other family members when contemplating a move. These considerations would suggest that married persons are less responsive to changes in their environment and/or personal situation.

Third, the characteristics of the husband may or may not dominate those of the wife with regard to family migration decisions. Finally, the sample partitioning was based on the fact that (1) there were too few married persons in the spring of 1972 to split the sample by marital status for the first analysis period; and (2) a statistical test indicated that for the second analysis period, there was no justification for separating the single subsample by sex ($F_{33, 3058} = 1.13$). In other words, the estimated coefficients for single males and single females were, in general, insignificantly different for the 1974-76 migration analysis. Hence, the two subsamples can be assumed in a statistical sense to originate from the same population. This finding is interesting because it suggests that single males and females, according to the model developed here, behave quite similarly. Therefore, if there are sex differences, they do not manifest themselves in the migration activity analyzed in this study.

3. Descriptive Statistics

In tables 1 and 2, descriptive statistics are presented for the samples. Because the student-military filters are imposed separately for each of the respective time periods, and because missing data problems varied for the two periods, the sample sizes differ. Therefore, the sample statistics are those presented separately for the two analysis periods.

The descriptive statistics are generally self-explanatory, although, a few need some elaboration. First, the E/POP and Community Income variables are based on 1970 Census data and are measured with respect to the three-digit zip code are in which a respondent resides at the beginning of each time period (see section D for a detailed explanation). In table 1, the E/POP is measured separately for male and female high school graduates, not in school or the military, aged 16-21, living in a given three-digit zip code area. Although not directly comparable, the percent of single males and females in our sample who were employed as of October 1974 (.88 and .86, respectively) is higher than the area E/PCP average for males (.80 and especially females (.60) at the time of the 1970 Census. Married female respondents have approximately the same employment-population ratios (.63) in 1974, while married male respondents have much higher ratios (.96). Hence, our sample reflects greater employability than the 1970 national average for a comparable population subgroup.

Second, our sample is drawn more heavily from the South and North Central regions than from the Northeast and West. Also, the sample tended to reside in relatively less populated localities than the general U.S. population in 1972, and to have lived in their high school locations for long periods of time. While a rigorous comparison between the NCES longitudinal sample and the overall U.S. student population is not the subject of this project, it does seem as though the sample is under-representative of larger cities and the Northeast and Western regions. In the analysis, an attempt is made to control for the geographic and school characteristics of the sample in order to "hold constant" the sample selection rule.

TABLE 6

DESCRIPTIVE STATISTICS FOR THE 1972-74 MIGRATION ANALYSIS
(sample proportions or means with standard deviations in parentheses)

Variable	Statistics Males(n=1701)		Females (n=2030)	
E/POP	.80	(.11)	.60	(.13)
Community Income ($1000s)	10.87	(2.21)	10.83	(2.23)
Region				
Northeast	.19		.21	
North Central	.30		.28	
South	.34		.36	
West	.18		.14	
Community Type				
Rural	.29		.28	
Small City	.27		.28	
Medium Metro	.19		.20	
Large Metro	.16		.16	
V. Large Metro	.10		.08	
Parents' SES	-.23	(.60)	-.30	(.61)
Yrs. Residence in HS Location				
> 18	.49		.47	
11-18	.19		.19	
5-10	.16		.17	
3-4	.09		.09	
≤ 2	.07		.09	
HS Class Size (10s)	32.10	(22.07)	32.49	(21.82)
Teacher-Student Ration x100	5.23	(1.65)	5.22	(1.66)
Counselor-Student Ration x 100	.40	(.24)	.40	(.22)
% HGCs in College	46.02	(17.87)	46.12	(17.42)
% HS Dropouts	7.35	(7.30)	7.99	(8.00)
HS Grade Average	73.90	(6.37)	77.93	(6.64)
HS Program	.69		.56	
Gen/Academic	.31		.44	
Homework				
None Assigned	.08		.04	
Don't Do	.15		.03	

(Continued)

TABLE 6 (Continued)

Variable	Males(n=1701)		Females (n=2030)	
< 5 Hrs/wk	.62			.57
≥ 5 Hrs/wk	.16			.36
Special Programs				
Yes	.16			.17
No	.84			.83
Remedial Instruction				
Yes	.10			.07
No	.80			.78
HS Leader				
Yes	.20			.22
No	.80			.78
Job Hrs/wk	18.18	(13.19)		12.16
Av. Aptitude Score	47.91	(6.65)	49.09	(6.58)
Race				
Nonwhite	.18		.20	
White	.82		.80	
Handicap				
Yes	.08		.05	
No	.92		.95	
English Speaking				
Yes	.92		.92	
No	.7		.09	
Marital Status				
Single	.73		.46	
Married in HS	.02		.08	
Married after HS	.25		.46	
# Siblings	2.01	(1.76)	2.17	(1.78)
Proportion Migrating: 6/72-10/74	.20		.18	

SOURCE: Mathematica Policy Research, Inc.

TABLE 7

DESCRIPTIVE STATISTICS FOR THE 1974-76 MIGRATION ANALYSIS

(Sample proportions or means with standard deviations in parentheses)

Variable	Single Males & Females (n=3043)		Married Females Respondents (n=1200)		Married Males Respondents (n=580)	
Overall E/POP	0.56	(0.05)	0.55	(0.05)	0.55	(0.05)
Community Income ($1000s)	11.20	(2.23)	10.41	(2.13)	10.30	(2.09)
Community Type: 10/74						
Rural	0.21		0.24		0.27	
Small City	0.27		0.31		0.33	
Medium City	0.19		0.18		0.15	
Large City	0.19		0.17		0.17	
V. Large City	0.14		0.10		0.08	
Parents' SES	-0.17	(0.64)	-0.31	(0.6[illegible])	-0.26	(0.60)
Yrs. Residence in HS Locacion						
> 18	0.48		0.48		0.47	
11-18	0.20		0.19		0.21	
5-10	0.16		0.16		0.16	
3-4	0.08		0.08		0.09	
≤ 2	0.08		0.08		0.06	
Counselor-Student Ratio x100	0.40	(0.22)	0.40	(0.22)	0.41	(0.22)
% HSgs in 2/4 yr College	47.78	(17.85)	44.25	(17.23)	42.69	(17.03)
%HS Dropouts	7.84	(8.09)	8.23)	7.78)	8.23	(8.10)
HS Program						
Gen/Academic	0.67		0.59		0.64	
Voced	0.33		0.41		0.36	
HS Grade Average	76.42	(6.79)	78.97	(6.56)	74.53	(6.27)
HS Leader						
Yes	0.25		0.29		0.27	
No	0.75		0.71		0.73	
Received Degree: 6/72 - 10/73						
Yes	0.10		0.09		0.08	
No	0.90		0.91		0.92	
Received Degree: 10/73 - 10/74						
Yes	0.16		0.09		0.14	
No	0.84		0.91		0.86	

(Continued)

TABLE 7 (Continued)

Variable	Single Males & Females (n=3043)		Married Females Respondents (n=1200)		Married Males Respondents (n=58b)	
Av. Aptitude Score	49.15	(6.99)	49.86	(6.41)	47.50	(6.55)
Race/Sex						
NW Female	0.11		0.18		-	
NW Male	0.09		-		0.17	
W Female	0.43		0.82		-	
W Male	0.37		-		0.83	
Roomate: 10/74						
Live Alone	0.11		-		-	
With Parents	0.70		-		-	
With Friends	0.18		-		-	
Labor Force Status: 10/74						
Employed	0.17		0.22		-	
Empl. Searching (S)	0.13		0.17		-	
Empl. willing to move (M)	0.28		0.12		-	
Empl. S & M	0.29		0.12		-	
Unemployed	0.03		0.10		-	
Unemployed, M	0.05		0.03		-	
Not in the Labor Force, M	0.02		0.04		-	
Not in the Labor Force	0.02		0.20		-	
Employment Status: 10/74						
Employed	0.87		0.63		0.96	
Not Employed	0.13		0.37		0.04	
Searching-Willingness to Move: 10/74						
Neither	0.20		0.42		0.21	
Searching (S)	0.16		0.27		0.12	
Willing to Move for a Job (M)	0.30		0.16		0.36	
S & M	0.34		0.15		0.31	
Av. Wkly Earnings: 1974 ($100s)	1.41	(2.83)	1.51	(7.23)	1.75	(2.36)
No. Jobs: 10/73 - 10/74						
No Moves	0.83		0.79		0.86	
One Move	0.11		0.15		0.10	
Repeat Moves	0.02		0.03		0.02	
Return Moves	0.04		0.02		0.02	
Spouse Education						
< HS	-		0.13		0.18	
HS Degree	-		0.45		0.58	
HS Degree & Voced	-		0.20		0.11	
Some College	-		0.23		0.11	

TABLE 7 (Continued)

Variable	Single Males & Females (n=3043)	Married Females Respondents (n=1200)	Married Males Respondents (n=580)
Any Kids			
Yes	-	0.36	0.35
No	-	0.64	0.65
Spouse Empl. Status: 10/74			
Employed	-	0.87	0.54
Not Employed	-	0.13	0.46
Ratio of Spouse to Family Income	-	0.48 (.33)	0.18 (0.19)
Proportion Migrating: 10/74 - 10/76	0.14	0.13	0.08

C. DEPENDENT VARIABLE AND ESTIMATION TECHNIQUES

The analysis seeks to explain what factors influence the decision to migrate. There is no objective mileage standard that indicates whether or not a geographic move is a long or short-distance move. For this study, migration is defined as a move of at least 100 miles from the point of origin. The 100-mile criterion was chosen in order to concentrate on long-distance moves, which makes sense in light of our desire to focus on the mobility of labor from one market to another.

Almost all other studies have been forced to use intercounty, interstate, or interdivisional moves as a measure of migration. Many short-distance moves, however, involve a change in county and/or state (e.g., cross-metropolitan), which would qualify as migration by this criterion, whereas many long-distance moves would not. The law of large numbers may reduce this problem if long-distance, cross-jurisdiction changes overwhelm the number of short-distance, cross-jurisdictional changes in location. To our knowledge, however, the relative magnitudes of the two types of moves have not been investigated. Because of this potential measurement problem, the actual mileage reported in the NCES data set offers a superior measure of (long-distance) migration.

Operationally, our dependent variable is dichotomous, taking on a value of unity if an individual moves at least 100 miles, and zero in all other instances. The use of a 0-1 dependent variable introduces several econometric problems that are not overcome with ordinary-least-squares (OLS) regression. Because the statistical problems are generally not too severe, the preliminary regressions used for specification tests and Chow tests were performed with OLS. The final estimation, however, was conducted with a logit model which is a maximum likelihood, nonlinear technique. In brief, the logit model predicts an S-shaped curve that is bounded by 0 and 1, and produces efficient and unbiased estimates. The use of the OLS regression model may result in predictions outside the 0-1 range (which does not make sense when estimating the probability of an event); and the estimated coefficients are inefficient and suffer from specification bias. For a more detailed discussion, see Appendix A.

The estimated logit results are presented in the following tables in sections D and E. Several points should be made to help the reader in using the tables. First, the migration equations are estimated by a logit model in which the dependent variable is the log-odds of migrating:

$$\log_e \left[\frac{Pr(M)}{1-Pr(M)} \right] = XB$$

$$X_{(n \times k)} = \text{data matrix}$$

$$B_{(k \times 1)} = \text{vector of coefficient parameters.}$$

Because the estimated parameters in column one of the tables are with respect to the log-odds of migrating, they can not be interpreted directly as the change in the probability of migrating, Pr(M), in response to a unit change in an independent variable. However, the log-odds of moving is a monotonic transformation of Pr(M); hence, the estimated coefficients do indicate the direction of change for Pr(M) as well as the statistical significance.

Second, to facilitate drawing inferences from the logit estimates, the predicted probabilities of migrating have been calculated for plus and minus one standard deviation from the mean of each independent variable (or the predicted group probability for categorical variables), conditional on all other explanatory variables being constrained to their mean values. These predictions are noted in column two of the tables. Third, the coefficients on each categorical variable have been estimated so that their respective weighted sums equal zero. Hence, there is no excluded group and the coefficients measure the differences from the sample proportion. The chi-square statistic for each categorical variable in column three sumarizes the test of equality of coefficients across categories (see Appendix A).

D. PROBABILITY OF MIGRATION; EMPIRICAL RESULTS FOR THE 1972-1974 PERIOD

The 1972-74 migration analysis focuses on males and females who were neither in school nor in the military as of October 1972. Persons were labeled as migrants if their October 1974 location was reported to be at least 100 miles from their origin location at the time of the spring 1972 survey (while still in high school). In our samples, 19.7 percent of the males and 18.4 percent of the females reported having migrated. The analysis of what influences the migration decision is organized along four principal lines of inquiry:

- Impact of local economic conditions
- Role of family background
- Impact of the high school and student performance
- Role of personal characteristics.

In what follows, (1) the hypothesized relationships between these factors and migration are discussed, (2) the empirical measures are described, and

(3) the empirical results are interpreted.

1. Impact of Local Economic Conditions

In light of the chronic unemployment of youth, the migration response to local economic conditions is particularly interesting: if job opportunities in a given labor market are relatively inauspicious, do young persons move to another area where more and better jobs are available? The link between migration and youth (un)employment is clear, yet little is known about whether, in fact, young persons recognize and respond to economic signals. Economic theory tells us that knowledgeable and rational decisions-makers will move away from low opportunity areas to locations offering better job opportunities. The analysis tests this hypothesis with two empirical measures of local economic conditions.

The first is the employment-population ratio (E/POP), calculated with 1970 Census data for each of approximately 900 three-digit zip codes in the U.S.[3] In addition to the geographic detail, the E/POP variable has been calculated precisely for the population group that is our subject of analysis: 16 to 21 year olds, high school graduates, out of school. Furthermore, separate E/POP variables have been created for four male/female, white/nonwhite groups. The geographic and sample specificity offer a major improvement in studying the role of the labor market over that used in previous analyses. The measure also avoids definitional problems inherent in the use of "unemployment" rates because the latter excludes persons not in the labor force. This omission is particularly severe for young workers for whom the unemployed-not in the labor force distinction is blurred at best.

The second measure of local economic conditions is average family income, calculated with 1970 Census data for each three-digit zip code area.[4] This community income variable has not been deflated for cost-of-living differences across localities because such deflators do not exist at our level of geographic disaggregation. Community income provides an index of local financial well-being and the _a priori_ expectation is that persons are more likely to move away from relatively depressed locations. Community income may also serve as a proxy for average wage differences across local areas, although it does not distinguish between labor and other income sources, nor does it reflect different amounts of family work hours.

For both males and females, the estimated coefficients on E/POP indicate that long distance moves are negatively and highly significantly related to job opportunities. The smaller the E/POP ratio, the more likely are graduates to migrate during the first two and a half years following high school. The estimated coefficients, suggest that males and females respond similarly to changes in employment conditions, although the average E/POP values for males and females differ considerably (80 and 60 percent respectively). As suggested by the predicted probabilities in column three, the migration response function is quite linear in the interval of ± 1 standard deviation from the representative mean values. For example, males (females) living in communities with E/POP ratios of .69 (.47) have a predicted probability of migrating of .198 (.200). In contrast, those residing in relatively attractive job opportunity areas with E/POP values of .906 (.726) have predicted probabilities of .152 (.138), all other variables held at their means. These predictions contrast with the predicted probabilities of the "typical" male and female (all explanatory variables set to their mean values) of .174 and .167, respectively.

This finding is important for policy purposes because it indicates that high school graduates, on average, are sensitive to labor market conditions. The results, of course, cannot tell us whether relocation decisions are sufficiently responsive to market oportunities from a policy perspective. But they do offer support that this group of young workers will tend to move from relatively poor labor markets without further government intervention than already exists. In addition, the results imply that if more or better labor market information were made available, location changes could be stimulated in the desired direction. If the analysis did not find such a negative and significant relationship, then such a policy consideration would not have the concrete empirical support that should precede such an undertaking. In terms of the theoretical model, the estimated response corroborates an important element of what is posited to govern migration behavior; namely, that location changes are influenced by the likelihood of securing a job in the current position.

The impact of community income is significant and negative for males but is statistically insignificant for females. This suggests that for our sample, males exhibit a tendency to move away from areas with low community income, as measured by the average family income for the origin three-digit zip code. This response is also consistent with the conceptual model of migration to the extent that community income approximates the potential earnings if a job is found in the current location.

Two other characteristics of the origin community are examined: the geographic region, and the size or type of the origin community. For males living in the northeast, migration is less likely to occur. but for other regions the likelihood is insignificantly different from the sample proportion. An explanation for this phenomenon is that distances between communities are much shorter in the northeast, which implies that changes in labor markets can be accomplished with shorter moves. With regard to community type, migration is estimated to be more likely for both males and females initially residing in small cities. Although the data do not indicate widespread differences by city size that are significant, a discernible pattern does emerge. First, contrary to historical movement off the farm and out of rural areas, this sample shows no such inclination after controlling for other factors. To some extent, this may reflect the recent trend of moving from large cities to small towns which may now offset the historical pattern that may still be taking place at a reduced rate. Second, there is a marked decline in the probability of moving away from larger metropolitan areas. This does not suggest entrapment of disadvantaged youth because the analysis controls for such characteristics. Rather, the pattern can be explained by the notion that larger labor markets implied by larger city sizes tend to attract or retain individuals because of the density and diversity of employment opportunities relative to smaller areas. In this context, the size of the city or labor market is consistent with the impact of E/POP in that job opportunities are weighted heavily in migration decision-making.

2. Role of Family Background

The socioeconomic status of a high school student's family has the potential for affecting both behavior and eventual success over a long period of time. Such factors as parental income, education and occupation, as well as the physical environment, may affect subsequent behavior and outcomes after the child leaves the home. These background factors have been summarized into a single SES scale in order to control for the influence of family background on migration.[5] The *a priori* expectation is that SES is positively correlated with migration. The data suggest that this is indeed the case for females, although the response of males is half that of females and is not significant. An explanation for the influence of SES is that higher SES families are more likely than those with a lower SES score to encourage greater independence and to provide financial support for their children when leaving home. Also, a greater awareness of other locations and the ability and willingness to learn about other areas may be related to SES in the same way as learning in general seems to be related to the family environment.

Another aspect of family background is the number of years that the individual has lived in the high school location, as of spring 1972. This variable is particularly interesting to demographers because it provides an opportunity to test empirically whether or not migration is related to mobility experience as a child. The estimated coefficients demonstrate a clear and significant association between the past and future events for both males and females. This is especially true in comparing otherwise similar graduates who have lived in their high school community all of their lives with those who have lived there for two years or less. The latter are twice as likely to move immediately after high school than the former. Possible explanations, for this phenomenon include the following: that living in other locations broadens horizons; that it lowers psychological inhibitions to moving to other places; and that it induces a return to communities where individuals had previously lived. A complementary interpretation is that youth who have lived in a community for shorter periods of time have not accumulated as much place-specific assets (friends, knowledge of where jobs are located, fondness for the community itself) which would be foregone if a move were undertaken. Hence they have lower economic and/or psychic costs than persons with longer durations of residence. Although more detail on past moves as a child would be enlightening, the available evidence does suggest there is an important tie between mobility experiences as a family dependent and those as an independent adult. The importance of this link to understanding migration behavior is further underscored by the strong positive association between current and future mobility as an adult.

3. Impact of the High School and Student Performance

The primary motivation behind the inclusion of high school characteristics is that the education system is, and should be, an important source of information about the world of work as well as the world at large. In addition to preparing students for postsecondary education, schools attempt to teach students how to gather and digest information, to evaluate options, to acquire further training, and to act as citizens. In the narrower context of this analysis, the skills and knowledge imparted by the secondary education system also may play an important role. Empirically, however, it is difficult to measure these intangible attributes, and researchers are forced to rely on more easily measured characteristics in an effort to capture the influence of the former.

The ratios of teachers to students and counselors to students (both with respect to total students), are designed to measure the degree of contact between student and teachers/counselors. The first ratio is of a more academic nature, while the latter is presumably more oriented toward careers and jobs. Both variables serve as rough approximations for the likelihood of students acquiring knowledge of post-high school options and the ability to appraise information. The results offer tentative support for this hypothesis in that female migration is significantly and positively related to the teacher-student ratio, while male migration is significantly and positively related to the counselor-student ratio. The negative association between migration and the teacher-student ratio for males is perplexing and contradicts the above hypothesis.

The size of the senior class, the percentage of seniors graduating in 1971 attending two and four-year colleges, and the percentage of tenth graders who drop out of high school offer another perspective on the high school influence. The general premise is that students gain location information from other students. Furthermore, the outward and upward movement of the student body provides another stimulus for migration. Both the example of peers moving away to attend college and the transmission of information concerning other locations by friendship networks would suggest that these student body characteristics should reflect the influence of such knowlege and activity. The empirical estimates indicate that only the percentage attending college has a significant effect and that the relationship is positive for both males and females. An academically oriented senior class seems to have spill-over effects in the form of greater mobility.

An individual's performance and activities as a high school student should theoretically affect the probability of migration. A curriculum and/or performance that increases work skills and the ability to assess information will induce greater mobility because such factors enhance the chances of finding a job elsewhere. Somewhat surprisingly, the high school grade average has no significant effect, nor does remedial instruction or reported hours of homework per week. Whether or not a person was a club or school government leader was expected to influence movement because leadership is assumed to reflect achievement motivation and a greater willingness to move on to new locations for greater economic rewards. The data, however, do not support this hypothesis during the 1972-1974 period. Club and government elections also reflect popularity which has an ambiguous influence an mobility. An academic or general high school program versus a vocational education (Voced) curriculum is positively correlated with female migration. Two factors may be at work here. First, the above argument about information gathering skills would suggest such a positive finding. Second, a more general high school program may lead to occupations that are part of a wider geographic market than are jobs for which Voced programs are geared. The possibility of local job placements out of high school for Voced students would also explain this relationship.

Participation in special education programs while in high school leads to a higher predicted probability for both sexes. Special programs include cooperative and work-study programs, Outward Bound, Neighborhood Youth Corps, and Talent Search. This finding suggests that there maybe something about this special experience that broadens a student's outlook in such a way that he/she is more willing, and perhaps more able, to change locations. The positive tie between hours worked per week while in high school for women strengthens the possible influence of gaining knowledge/experience of the labor market and future migration.

The results are not conclusive, but when considered together, they do suggest an underlying phenomenon that may be taking place. Employment-related experience and job-location knowledge acquired in high school seem to elicit greater geographic movement. That this is more pronounced for women than men makes sense because the latter are historically more strongly attached to the labor market than the former and are, therefore, less subject to change, whereas the former are much closer to the margin between working and not working, moving and not moving. However, an important caveat must be stressed in interpreting the findings: the apparent influence of student experience/performance variables may be more indicative of unobserved characteristics of the individuals selecting and performing those activities than are the experiences gained through the activities.

4. Personal Characteristics

The average score across six aptitude tests administered in the 1972 survey is used to estimate the role of an individual's aptitude or intelligence. While it is unclear whether aptitude, as measured here, is strictly innate, influenced by schooling, or determined by both factors, the latter is probably the most acceptable explanation. Theoretically, an individual's ability to acquire and interpret information, as well as the ability to learn quickly on-the-job and to conduct effective interviews should promote the chances of finding a job locally or in more distant markets. Other things being equal, we predict such an aptitude to be positively associated with migration, and the data offer strong confirmation of

TABLE 8

LOGIT COEFFICIENTS ON THE PROBABILITY OF MALES MIGRATING: 1972-1974

(absolute value of asymptotic t ratios in parentheses)

Variable	Logit Coefficient[a]		Predicted Probability[b]	(MIG)	Chi-square[c]
E/POP	-1.478	(2.31)**	.198	.152	
Community Income	-.102	(2.45)**	.208,	.144	
Region					4.24
Northeast	-.259	(1.70)*		.140	
North Central	-.070	(0.64)		.164	
South	.151	(1.35)		.196	
West	.108	(0.77)		.190	
Community Type					10.01**
Rural	.060	(0.49)		.182	
Small City	.300	(2.83)***		.220	
Medium Metro	-.143	(1.01)		.154	
Large Metro	-.356	(2.13)**		.128	
V. Large Metro	-.143	(0.68)		.154	
Parents' SES	.165	(1.37)	.160,	.188	
YRS in Residence					38.68***
> 18	-.325	(4.70)***		.132	
11-18	.236	(1.89)*		.210	
5-10	.089	(0.62)		.187	
3-4	.344	(1.83)*		.229	
≤ 2	1.009	(5.07)***		.366	
HS class size	.006	(1.54)	.155,	.194	
Teacher-student ratio	-.100	(1.70)*	.199,	.151	
Counselor-student ratio	.693	(2.24)**	.151,	.199	
%HSGs in college	.012	(2.85)***	.145,	.206	
% HS dropouts	-.011	(1.12)	.186,	.162	
HS Grade Average	-.005	(0.42)	.170,	.178	
HS Program					2.09
Gen/Academic	-.067	(1.45)		.164	
Voced	.146	(1.45)		.196	

(Continued)

TABLE 8 (Continued)

Variable	Logit Coefficient[a]		Predicted Probability[b] (MIG)		Chi-square[c]
Homework					2.92
None Assigned	.282	(1.45)		.137	
Don't Do	-.166	(1.01)		.151	
< 5 hrs/wk	.078	(1.52)		.185	
≥ 5 hrs/wk	-.018	(0.12)		.171	
Special Programs					3.52*
Yes	.286	(1.88)*		.219	
No	-.054	(1.88)*		.166	
Remedial Instruction					.27
Yes	-.108	(0.52)		.159	
No	.012	(0.52)		.175	
HS Leader					.01
Yes	-.011	(0.09)		.172	
No	.003	(0.09)		.174	
Job Hrs/wk	-.007	(1.33)	.187,	.161	
Av. Aptitude Score	.026	(2.12)**	.150,	.200	
Race					1.51
Nonwhite	.207	(1.23)		.205	
White	.045	(1.23)		.167	
Handicap					1.91
Yes	-.338	(1.38)		.130	
No	.029	(1.38)		.178	
English Speaking					.39
Yes	-.001	(0.63)		.172	
No	.143	(0.63)		.195	
Marital Status					7.26**
Single	.106	(2.42)**		.189	
Married in HS	-1.342	(1.92)*		.052	
Married after HS	-.201	(1.69)*		.147	

(Continued)

TABLE 8 (Continued)

Variable	Logit Coefficient[a]		Predicted Probability[b] (MIG)		Chi-square[c]
# Siblings	.078	(2.15)**	.155,	.194	
Constant	-1.259	(1.12)			
R^{2d} =	.081				
Chi-square =	134.66***				
N =	1701				

a: Coefficients for categorical variables indicate group differences from the sample mean and are standardized so their weighted sum equals zero.

b: Predicted likelihood of MIG is conditional on other explanatory variables being constrained to their mean values. For a continuous variable, the predicted probability is evaluated at ± 1 standard deviation from its mean. The predicted probability of MIG is .174 when all explanatory variables are set equal to their respective mean values.

c: Chi-square statistic is with respect to the null hypothesis that the predicted probabilitiy of MIG is equal across all groups of a categorical variable.

d: R^2 is not maximized in the MLE logit model. The calculated R^2 is equal to the percentage difference between the geometric means calculated respectively from the predicted MIG probabilities and the observed sample frequencies for searchers and nonsearchers, taken with respect to one minus the geometric mean of the sample frequencies.

*: 10% level of significance, two-tailed test.

**: 5% level of significance, two-tailed test.

***: 1% level of significance, two-tailed test.

TABLE 9

LOGIT COEFFICIENTS ON THE PROBABILITY OF FEMALES MIGRATING: 1972-1974

(absolute value of asymptotic t ratios in parentheses)

Variable	Logit Coefficient[a]		Predicted Probability[b]	(MIG)	Chi-sqaure[c]
E/POP	-1.739	(2.56)**	.200,	.138	
Community Income	.003	(0.08)	.166,	.168	
Region					1.47
Northeast	.050	(0.39)		.174	
North Central	-.122	(1.19)		.151	
South	.061	(0.63)		.175	
West	.011	(0.07)		.168	
Community Type					6.55
Rural	.007	(0.07)		.168	
Small City	.207	(2.13)**		.198	
Medium Metro	-.022	(0.17)		.164	
Large Metro	-.116	(0.74)		.151	
V. Large Metro	-.475	(1.91)*		.111	
Parents' SES	.345	(3.07)***	.139,	.198	
YRS in Residence					22.81***
> 18	-.113	(1.69)*		.152	
11-18	-.057	(0.45)		.159	
5-10	.093	(0.67)		.154	
3-4	.121	(0.65)		.184	
≤ 2	.755	(4.68)***		.299	
HS Class Size	.003	(0.67)	.159,	.175	
Teacher-student ratio	.105	(2.75)***	.144,	.192	
Counselor-student ratio	.246	(0.79)	.159,	.174	
% HSGs in College	.008	(1.85)*	.149,	.186	
% HG Grade Average	-.007	(0.75)	.174,	.159	
HS Average	-.010	(0.90)	.176,	.158	
HS Program					5.67**
Gen/Academic	.137	(2.38)**		.187	
Voced	-.172	(2.38)**		.144	

(Continued)

TABLE 9 (Continued)

Variable	Logit Coefficient[a]		Predicted Probability[b] (MIG)		Chi-square[c]
Homework					
None Assigned	.114	(0.41)		.183	
Don't Do	.215	(0.70)		.199	
< 5 hrs/wk	.053	(0.99)		.174	
$\geq$ 5 hrs/wk	-.114	(1.38)		.152	
Special Programs					5.40**
Yes	.308	(2.32)**		.214	
No	-.064	(2.32)**		.158	
Remedial Instruction					.41
Yes	.146	(0.64)		.188	
No	-.011	(0.64)		.165	
HS Leader					.32
Yes	.065	(0.57)		.176	
No	-.019	(0.57)		.164	
Job Hrs/wk	.009	(1.79)*	.152,	.182	
Av. Aptitude Score	.003	(2.82)***	.138,	.200	
Race					.02
Nonwhite	-.023	(0.14)		.164	
White	.006	(0.14)		.168	
Handicap					.87
Yes	-.278	(0.93)		.132	
No	.014	(0.92)		.169	
English Speaking					3.02*
Yes	-.031	(1.74)*		.163	
No	.330	(1.74)*		.218	
Marital Status					4.17
Single	-.133	(1.98)**		.149	
Married in HS	.031	(0.15)		.171	
Married after HS	.126	(1.95)*		.185	

(Continued)

TABLE 9 (Continued)

Variable	Logit Coefficient[a]		Predicted Probability[b] (MIG)		Chi-square[c]
# Siblings	-.034	(0.28)	.175,	.158	
Constant	-2.461	(2.58)***			
R^{2d} =	.061				
Chi-square =	116.76***				
N =	2023				

a: Coefficients for categorical variables indicate group differences from the sample mean and are standardized so their weighted sum equals zero.

b: Predicted likelihood of MIG is conditional on other explanatory variables being constrained to their mean values. For a continuous variable, the predicted probability is evaluated at ± 1 standard deviation from its mean. The predicted probability of MIG is .174 when all explanatory variables are set equal to their respective mean values.

c: Chi-square statistic is with respect to the null hypothesis that the predicted probabilitiy of MIG is equal across all groups of a categorical variable.

d: R^2 is not maximized in the MLE logit model. The calculated R^2 is equal to the percentage difference between the geometric means calculated respectively from the predicted MIG probabilities and the observed sample frequencies for searchers and nonsearchers, taken with respect to one minus the geometric mean of the sample frequencies.

*: 10% level of significance, two-tailed test.

**: 5% level of significance, two-tailed test.

***: 1% level of significance, two-tailed test.

this hypothesis. To the extent that aptitude is influenced by schooling, the estimated impact suggests another route by which schools might affect their graduates' labor force success through migration.

Finally, the marital status of individuals is hypothesized to influence the propensity to migrate. The estimated coefficents are generally significant and offer some interesting contrasts between the two samples. The pattern displayed by males conforms to our earlier expectations: single persons are less encumbered than are married couples and thus are more mobile. Husbands must also consider the wife's location-job preferences which limit the net gains available from moving. The estimated difference between males married before graduation and those who marry during the analysis period is also plausible. First, the negative marital influence still remains as expected. Second, demographers have generally found that life cycle events such as marriage and divorce are positively related to geographic mobility as individuals seek locations amenable to their changed status.

The results for females stand in contrast to the above. Two hypotheses are put forth: First, single females may be more cautious and/or more likely to live with their parents for the first few years after graduation, suggesting a lower probability of moving. Second, the positive correlation between moving and a recent marriage supports the change in life cycle theory, and the positive sign may reflect a social phenomenon of females following their husbands, rather than the reverse. In addition, unobserved characteristics of the husbands may be positively correlated with migration which, in turn, suggests that the marriage effect for our female respondents may be spurious.

E. PROBABILITY OF MIGRATION: EMPIRICAL RESULTS FOR THE 1974-1976 PERIOD

The 1974-1976 migration analysis focuses on single males and females, married female respondents, and married male respondents who were out of school and out of the military as of October 1974. The proportions of each of the three samples reporting a long distance move (> 100 miles) during the two year period are respectively, .136, .127, and .076. The discussion of what factors influence the decision to migrate is organized similarly to the preceding section and includes some additional areas:

- Impact of local economic conditions
- Role of family background
- Impact of the high school and student performance
- Role of personal characteristics
- Labor force status as of October 1974
- Employment experience between October 1973 and October 1974
- Influence of 1972-74 migration.

In the following discussion, (1) the hypothesized relationships between these factors and migration are discussed, (2) the empirical measures are described, and (3) the logit results are interpreted. As will become apparent, there are some interesting similarities and differences between single and married households. A surprising and somewhat unexplicable outcome was that the results for married male respondents were uniformly insignificant. This is in stark contrast to the estimates for single persons and married females. There is no reason to expect husband-wife households with a male respondent to differ significantly from those with a female survey respondent. Other than the possibility of pervasive interview response errors committed by husband respondents, the most likely explanation is that the small sample of 580 is subject to idiosyncratic results that are not generally applicable to the population of married households. Although the results for the sample are reported in Table 12, the discussion focuses on the samples of single persons and married households whose data were supplied by the wife.

1. Impact of Local Economic Conditions

The 1972-74 analysis used a measure of job opportunities, E/POP, that was measured specifically for the type of sample being investigated. Experiments using alternate measures led to the conclusion that the variable used in the analysis was the most appropriate.[6] The same E/POP variable, measured for the zip code area corresponding to the 1974 location, was used in the 1974-76 estimation but was found to be insignificant. We conjectured that the insignificance could be explained partly by the time that had elapsed since the 1970 census data and the 1974-76 period. Perhaps more importantly, the graduating class of 1972 was 22 years old in 1974 and many had entered the economic mainstream. These possiblities suggested that an E/POP calculated only for 16-21 year olds was no longer appropriate and that a better measure using 1970 Census data would be one that included older workers as well as young workers. Hence, an overall-E/POP ratio was constructed for all persons in the civilian non-institutionalized population, aged 14 years and over, for each three-digit zip code. Separate race and sex E/POP variables were not created.

The estimated coefficients on the overall-E/POP variable for singles and married households offer an interesting contrast. First, the probability of migration for single males and females continues to be very responsive to employment conditions: low-opportunity areas tend to repel singles while higher job opportunity areas seem to retain young singles, ceteris paribus. The policy importance of this relationship cannot be overly stressed because it provides empirical substance to the hypothesis that individuals react to market signals in a rational fashion. Again, we cannot ascertain from the data whether the sample exhibits the "optimal" degree of responsiveness, but only that a systematic pattern exists.

Second, the difference in the size of coefficients on overall-E/POP for singles in 1974-76 and that on E/POP for males and females in 1972-74 is consistent with our expectations. Changes in overall labor market conditions are generally believed to have a disproportionate impact on workers who are less securely integrated into the labor force (i.e., the lower skilled, more recent entrants). Hence, a small change in overall-E/POP connotes a larger change in E/POP for 16-21 year olds. This relationship is reflected in the estimated coefficients on the E/POP variables for the two time periods. Third, the coefficient on overall-E/POP is insignificant for married households. Although an insignificant coefficient was not expected, the result is consistent with the notion that single persons are more mobile and responsive to economic opportunities than are married persons. If this is indeed the case, the results imply that married persons constitute a considerably less responsive part of the labor force than single persons. To test whether the impact of overall-E/POP was dependent on the October 1974 employment status of either or both spouses, several "not employed-overall E/POP" interactions were tried. The results, however, were again insignificant, suggesting that married households have stronger, unobserved locational ties than single persons which diminish the influence of local job opportunities on the likelihood of migration.

Community income, calculated from 1970 Census data for the 1974 zip code area of residence, proved to be insignificant for all samples. It is unclear whether or not the absence of any systematic tie reflects the somewhat outdated 1970 Census data. The type of community seems to have no apparent effect for singles. For married households, however, location preferences are noticeable. There is a noticeable inclination to remain in rural areas and to move away from small and medium sized localities. Residents of larger cities do not differ from the average. Our speculation is that young married couples have made committments to their rural community and may have already established employment and friendship ties. Those living in small and medium-sized areas may, on the other hand, find it difficult to secure employment for both spouses. Frank (1978) finds a tendency for working couples to move to large metropolitan areas. In this sense, the rural residents offer contradictory evidence. However, there may be an unobserved taste for a rural, farming, or small town life style that offsets the Frank thesis. As described in the job search chapter, family contacts are an important source of employment in rural areas, which may help to explain why rural residents are reluctant to leave.

2. Family Background

The socioeconomic background, as measured by the parental family SES in 1972, has a significant influence on the likelihood of migration during 1974-76. The persistence of this effect beyond the 1972-74 period suggests that SES is capturing more than just parental financial support. Rather, the background SES of single males and females and married women may serve as an indicator of a household's predisposition to move that goes beyond economic behavior to a more ambiguous, yet influential factor consisting of career goals and an awareness of geographic locations. Alternatively, there may be something about a relatively higher SES background that reduces psychological inhibitions to migrating.

The years of residence in the high school location (as of spring 1972), has an influence on later migration, although the effect has become considerably attenuated by 1974-76 as compared to the 1972-74 period. For singles, the probability of migration is significantly lower for those who had lived in their 1972 location all of their lives (.085), than otherwise similar persons with shorter residential duration. The socioeconomic bonds implied by lifelong duration continue to discourage mobility. This effect also seems to be present for married women, although it is only marginally significant in a statistical sense.

In an unreported logit equation, the variable "Past Moves: 1972-74" was excluded, which resulted in increased significance for the variable "Years Residence in High School Location". In particular, a lifelong duration had a significant negative impact for both samples, and a duration of two years or less had a significant positive influence on migration for both samples. The 3-4 years and 5-10 years of duration effects remained the same. The reason this variable drops in explanatory power with the inclusion of past moves is that the years of residence variable has both a direct effect on 1974-76 moves and an indirect effect through its earlier impact on 1972-74 moves. Once the earlier moves have taken place, the results suggest that the strength of the residence duration varible diminishes and retains only ucattered significance. This path of causality can be viewed in a recursive framework where initial years in residence influences migration, and migration in turn affects subsequent mobility.

3. High School and Student Performance

The high school characteristics generally have little significant impact by 1974. Moreover, the coefficient estimated on the Counselor-Student Ratio for married women appears to be counter-intuitive on the surface and contrasts with its positive and significant effect on 1972-74 movement. One possible explanation for this negative correlation is that the Counselor-Student Ratio tends to foster one-time-only moves. Graduates may be more likely to move soon after leaving high school, the larger the ratio (the more/better is the job information supplied by school personnel), but thereafter, tend to remain in one location.

The individual's performance in high school and receipt of post-secondary degrees/certificates does not appear to influence migration. For single persons, however, a general or academic high school curriculum does have a significant positive influence, echoing its earlier influence on 1972-74 moves. For married females (and married males in this instance) who were high school leaders (clubs, student government), there is a higher estimated probability of migrating versus those who were not. A similar effect is found for single persons although the coefficient is not estimated with much statistical reliability.

4. Personal Characteristics

The average aptitude score administered in the spring of 1972 continues to have a strong positive influence on the likelihood of migrating. For both single persons and married women, a higher tested aptitude induces greater mobility. The persistence of this effect over time lends further credence to the notion that the ability to acquire and assess information is an important factor. Conceptually, an awareness of alternate opportunities is crucial in making a migration decision because the latter is assumed to be based on an awareness of alternative opportunities. The positive tie between parental SES, a general/academic program, and aptitude on one hand, and the occurrence of geographic mobility on the other, reinforces the hypothesis that knowledge and skills acquired from school and family have effects beyond those typically assigned to the education system.

Race and sex remain insignificant for the second analysis period. The roommate variable for single persons does play an influential role. Living with one's parents in October 1974 reduces the probability of moving for two possible reasons. First, the living arrangement may reflect a predisposition not to move, while living with friends suggests no such preselection. Second, living with parents implies a housing subsidy which would be lost if a move were undertaken.

5. Labor Force Status: October 1974

The labor force status of potential migrants has a clear theoretical impact on migration. First, employed workers, ceteris paribus, have higher opportunity costs than workers without jobs. The former are presumably concerned not only with securing a job if a move were undertaken, but also with finding a job with a higher wage rate in order for a move to be financially advantageous. In fact, the expected wage increase should be large enough to at least cover the costs of relocating. Persons without jobs are not faced with such opportunity costs, and hence, should be more likely to move. Second, workers who are looking for a job are theoretically more likely to migrate because they are "in the job market" as opposed to those who are not looking. Third, job search that encompasses a wider geographic range should be more highly correlated with migration than a more narrowly defined search effort. The data provide a rough approximation of the geographic scope of search with a yes-no questionnaire response concerning the "willingness to move to get a job." A positive answer, especially coupled with concurrent job search activity, is predicted to have a positive influence on the likelihood of a move.

The empirical results provide strong confirmation for the above hypotheses. For both samples, employed workers who are neither engaged in search nor willing to move, have a substantially lower probability of moving (.075 and .032 for single and married women respectively). Employed workers reported to be searching or willing to move have migration propensities that are indistinguishable from the sample proportions. Employed single persons engaged in search and who are willing to relocate for a job are more likely to move, as predicted by the theoretical model. Thus, it is not just employment status per se that matters, but whether or not an employee is in the market for a job in the local as well as more distant labor markets.

With some exceptions (e.g., temporary layoff victims), an individual who is without employment but has been looking for work within the past four weeks is officially described as an "unemployed" worker according to the U.S. Census. A jobless worker who has not been recently looking for work is classified as "out of the labor force". Hence, the unemployed label used in tables 10-12 implies an active job search as of October 1974. Among singles, a jobless worker looking for work and willing to relocate exhibits a much greater probability of migrating (.195) than the sample average. Unemployed single workers not willing to move for a job have no such proclivity. For married females, unemployment status itself is linked to a higher probability of migrating (.105). The discrepancies between the two samples may reflect the influence of the spouse which, of course, is not present in the singles sample.

In both samples, workers not in the labor force (NLF) but who are willing to relocate for employment, have significantly higher probabilities of migrating. The fact that they are not looking for work but still have higher probabilities than the sample proportions suggests that their NLF status is temporary - young workers are especially noted for their movement in and out of the labor force.

For married women, the spouse's October 1974 labor force status is also a relevant factor. Unfortunately, the "search-willingness to move" data were not collected for spouses, but in any case, the employed-not employed dichotomy is quite revealing. As noted above, jobless workers are more likely to move because of lower opportunity costs, and this hypothesis also applies to husbands as well as to wives. Furthermore, the employment status of the husband apears to have a much larger impact on family migration decisions than does the wife's. An unreported logit equation collapsed the wife's detailed labor force variable into a single employed (E) - not employed (NE) variable with which to contrast the husband's E-NE variable. The wife's estimated coefficients (t ratios in parentheses) were - .271(2.53) for E, and .458(2.53) for NE, with respective predicted probabilities of .044 and .088. While employment of either spouse tends to depress the likelihood of moving, the predicted chance of moving when the husband is not employed (.189) is more than twice as large as when the wife is not working, ceteris paribus. The effects of both spouses being either employed or not employed were found to be insignificant. These results support a male dominance theory of married households. This does not necessarily imply that wives are overruled in family decision-making, but instead, may suggest that the husband's work skills or the husband's long run financial contribution to the family is deemed more important by families than that of the wife.

6. Employment Experiences Between October 1973 and October 1974

For single males and females, recent experience in the labor market has a significant effect on the likelihood of mobility. Weekly earnings, averaged over calendar 1974, reflect another pecuniary opportunity cost associated with a location change. The higher the earnings at origin, the higher must be the expected earnings in order to induce a move. However, the chances of finding a higher paying job are lower, the higher are the origin wages, holding skills constant.

The number of weeks of recent employment is another indicator of attachment to the current job location. A worker who has experienced a more stable pattern of employment is expected to be less inclined to forsake such a situation, and the data are consistent with this relationship. The number of jobs held over the recent past measures the incidence of multiple job holding as well as the number of job changes per se. The negative coefficient suggests that workers who either have several jobs or move from job to job within the local labor market are more committed to their current location. Perhaps the information on job vacancies (where to find them, requirements, and remuneration) acquired by mobile workers can be viewed as a location-specific stock of information that would be lost if a move were undertaken. For married females, the recent labor market history does not seem to matter. The interdependence with unobserved husband's labor force experience and possibly the dominance effect may partly explain this lack of significance.

Finally, the ratio of the husband's earnings to family labor earnings is included in quadratic form. These two variables are intended to capture whether or not migration is more likely when family earnings are derived principally from one spouse (either a low or high ratio). The tied-mover hypotheses described in the literature review predicts that families are least likely to migrate when both spouses have a vested employment interest in the origin location. Put differently, the probability of a move is lower if both jobs are of equal financial importance to the family than if only one spouse's earnings is crucial. The former implies that two jobs would probably be sought out with a move whereas the latter suggests that only one would be. The data, however, are not supportive of the Mincer (1978) tied-mover hypothesis. Neither variable has a significant coefficient. The equation was also reestimated without the labor force variables of either spouse to minimize any multicollinearity but again, the results were disappointing. Taking the estimated coefficients at face value, we took the first derivative with respect to the two income ratio variables to calculate the ratio at which predicted migration would be at a minimum. The calculations yielded .40 as the minimum value which, if the insignificance were ignored, would indicate that migration was least likely when both spouses contributed roughly the the same proportion to family income.

7. Influence of 1972-1974 Migration

One of the most repeated findings in the demographic literature is that past moves are postively correlated with future moves. Our samples, including married males in this case, are no exception. Even at a very young age, migration appears to beget migration. Those who did not move during 1972-74 are much less likely to move in 1974-76, suggesting that a location equilibrium existed then and continues to exist into the next two-year period. An attempt was made to discern whether or not multiple moves made during 1972-74 had a differential impact on subsequent moves versus once-only movers. DaVanzo (1978) has found a useful and significant distinction between multiple movers who migrate to yet another location and those who move again, but return to an earlier location. This was tested using information on three-digit zip codes for the 1972 and 1974 locations. If two moves had occurred during the first analysis period and the 1972 and 1974 three-digit zip codes were the same, then it was assumed that a "return" move was made. Otherwise, a "repeat" move was presumed to have occurred.

The estimated coefficients are highly significant for all three samples and clearly indicate the tie between past and future mobility. In all cases, previously immobile persons have a much lower probability of moving than similar persons who have moved at least once in the recent past. For single males and females, there does not appear to be any difference between the number and type of past moves and the likelihood of moving again during 1974-76. Married male and female respondents, however, demonstrate a much smaller likelihood of migrating if they had recently moved and then returned to their 1972 location (as defined by three-digit zip codes). For married males, there is also a distinction between repeat migrants and those who returned or moved only once during 1972-74. The results for married households correspond closely with DaVanzo's findings which were estimated for white, husband-wife families contained in the Michigan Panel Study of Income Dynamics. Our results imply that the

TABLE 10

LOGIT COEFFICIENTS ON THE PROBABILITY OF SINGLE MALES AND FEMALES MOVING: 1974-1976

(absolute value of asymptotic t ratios in parentheses)

Variable	Logit Coefficient^a		Predicted Probability^b	(MIG)	Chi-square^c
Overall E/POP	-5.531	(3.53)**	.130,	.081	
Community Income	.001	(0.02)	.103	.103	
Community Type					1.85
Rural	-.141	(1.12)		.091	
Small City	-.016	(0.17)		.102	
Medium City	.121	(1.03)		.115	
Large City	.028	(0.24)		.106	
Very Large City	.040	(0.27)		.107	
Parents' SES	.265	(2.66)***	.088,	.120	
YRS Residence in HS Location					13.34***
> 18	-.217	(3.47)***		.085	
11-18	.118	(1.06)		.114	
5-10	.293	(2.42)**		.133	
3-4	.166	(0.91)		.119	
≤ 2	.255	(1.43)		.129	
Counselor-Student Ratio	-.172	(0.62)	.106,	.100	
% HSGs in College	-.002	(0.54)	.100,	.106	
% HS Dropouts	.006	(0.76)	.108,	.098	
HS Program					3.64*
Gen/Academic	.087	(1.91)**		.111	
Voced	-.177	(1.91)**		.088	
HS Grade Average	.005	(0.49)	.100,	.106	
HS Leader					1.74
Yes	.127	(1.32)		.115	
No	-.043	(1.32)		.099	

(Continued)

TABLE 10 (Continued)

Variable	Logit Coefficient^a		Predicted Probability^b (MIG)		Chi-square^c
Received Degree: HS-10/73					.05
Yes	-.036	(0.22)		.100	
No	.004	(0.22)		.103	
Received Degree: 10/73-10/74					.43
Yes	-.085	(0.66)		.095	
No	.016	(0.66)		.105	
Av. Aptitude Score	.020	(1.80)*	.091,	.116	
Race/Sex					.96
Nonwhite Female	.098	(0.53)		.112	
Nonwhite Male	-.146	(0.69)		.090	
White Female	.035	(0.50)		.106	
White Male	-.033	(0.42)		.100	
Roomate					4.96*
Live Alone	.098	(0.64)		.112	
With Parents	-.078	(2.07)**		.096	
With Friends	.236	(2.10)**		.127	
Labor Force States: 10/74					19.86***
Employed	-.346	(2.19)**		.075	
Empl, Searching (S)	-.212	(1.35)		.085	
Empl, Willing to Move for Job(M)	-.054	(0.55)	.098		
Empl, S&M	.179	(2.02)		.121	
Unemployed	.196	(0.65)		.123	
Unempl, M	.764	(3.45)***		.195	
Not in Labor Force, M	.389	(1.17)		.145	
Not in Labor Force	-.005	(0.01)		.102	
Average Weekly Earnings 1974	-.079	(1.91)*	.126,	.084	

(Continued)

TABLE 10 (Continued)

Variable	Logit Coefficient[a]		Predicted Probability[b] (MIG)		Chi-square[c]
# Jobs: 10/73-10/74	-.019	(1.92)*	.126,	.084	
# Weeks Empl: 10/73-10/74	-.009	(1.91)*	.115,	.092	
Past Moves: 1972-1974					125.72***
No Moves	-.249	(11.14)***		.082	
One Move	1.116	(8.72)***		.260	
Repeat Moves	1.483	(5.65)***		.336	
Return Moves	1.213	(5.64)***		.279	
Constant	.189	(0.18)			
R^{2d} =	.145				
Chi-square[c] =	361.920***				
N =	3093				

a: Coefficients for categorical variables indicate group differences from the sample mean and are standardized so their weighted sum equals zero.

b: Predicted likelihood of MIG is conditional on other explanatory variables being constrained to their mean values. For a continuous variable, the predicted probability is evaluated at ± 1 standard deviation from its mean. The predicted probability of MIG is .103 when all explanatory variables are set equal to their respective mean values.

c: Chi-square statistic is with respect to the null hypothesis that the predicted probability of MIG is equal across all groups of a categorical variable.

d: R^2 is not maximized in the MLE logit model. The calculated R^2 is equal to the percentage difference between the geometric means calculated respectively from the predicted MIG probabilities and the observed sample frequencies for searchers and nonsearchers, taken with respect to one minus the geometric mean of the sample frequencies.

*: 10% level of significance, two-tailed test.

**: 5% level of significance, two-tailed test.

***: 1% level of significance, two-tailed test.

TABLE 11

LOGIT COEFFICIENTS ON THE PROBABILITY OF MARRIED FEMALES MOVING: 1974-1976

(absolute value of asymptotic t ratios in parentheses)

Variable	Logit Coefficient[a]		Predicted Probability[b] (MIG)		Chi-square[c]
Overall E/POP	-2.136	(0.77)	.063,	.052	
Community Income	-.023	(0.32)	.060,	.055	
Community Type					11.90**
Rural	-.738	(2.84)***		.028	
Small City	.314	(1.93)**		.077	
Medium City	.409	(1.94)**		.084	
Large City	-.174	(0.73)		.067	
V. Large City	-.261	(0.74)		.045	
Parents' SES	.338	(1.68)*	.047,	.070	
YRS Residence in HS Location					8.04*
> 18	-.153	(1.33)		.050	
11-18	-.085	(0.38)		.053	
5-10	-.009	(0.03)		.057	
3-4	.788	(2.59)***		.118	
≤ 2	.315	(0.98)		.077	
Counselor-Student Ratio	-1.260	(2.12)**	.074,	.044	
% HSGs in College	-.007	(1.07)	.064,	.051	
% HS Dropouts	-.010	(0.64)	.067,	.053	
HS Program					1.15
Gen/Academic	-.101	(1.07)		.052	
Voced	.145	(1.07)		.006	
HS Grade Average	-.027	(1.32)	.067,	.049	
HS Leader					4.26**
Yes	.340	(2.06)**		.079	
No	-.141	(2.06)**		.050	

(Continued)

TABLE 11 (Continued)

Variable	Logit Coefficient[a]		Predicted Probability[b] (MIG)		Chi-square[c]
Received Degree:					
HS-10/73					1.10
Yes	-.403	(1.05)		.039	
No	.040	(1.05)		.060	
Av. Aptitude Score	.049	(2.02)**	.043,	.077	
Race					1.33
Nonwhite	-.329	(1.15)		.042	
White	.074	(1.15)		.061	
Spouse's ED					.56
< HS	.195	(0.66)		.069	
HS	-.049	(0.40)		.055	
HS & Voced	-.056	(0.25)		.054	
≥ College	.036	(0.19)		.059	
Any Kids					.89
Yes	.157	(0.94)		.066	
No	-.090	(0.94)		.053	37.07***
Spouse's Employment Status					
Employed	-.200	(6.09)***		.048	
Not Employed	-1.343	(6.09)***		.189	
Labor Force Status -10/74					13.89*
Employed	-.621	(2.28)		.032	
Empl, Searching (S)	.269	(1.06)		.044	
Empl, willing to move for job (M)	.185	(0.59)		.068	
Empl, S&M	.175	(0.64)		.068	
Unemployed	.659	(2.23)**		.105	
Unemployed, M	.420	(0.72)		.085	
Not in Labor Force, M	.961	(2.24)**		.137	
Not in Labor Force	.079	(0.30)		.062	
# Jobs Held: 10/73 10/74	.004	(0.21)	.056,	.059	

(Continued)

TABLE 11 (Continued)

Variable	Logit Coefficient[a]		Predicted Probability[b] (MIG)		Chi-square[c]
# Weeks Empl. 10/73 10/74	.014	(1.51)	.044,	.074	
Ratio of Spouse to Family Income	-.1.245	(0.76)	.084,	.039	
Ratio of Spouse to Family Income- Sqd.	1.512	(0.85)	.038,	.085	
Av. Weekly Earnings 1974	-.028	(1.77)*	.215,	.013	
Past Moves: 1972-74					89.37***
No Moves	-.422	(9.02)***		.038	
One Move	1.801	(8.88)***		.269	
Repeat Moves	1.675	(4.08)***		.245	
Return Moves	.376	(0.63)		.081	
Constant	-.807	(0.40)			
R^{2d} =	.288				
Chi-square[c] =	277.250***				
N =	1200				

a: Coefficients for categorical variables indicate group differences from the sample mean and are standardized so their weighted sum equals zero. (number of observations in parentheses)

b: Predicted likelihood of MIG is conditional on other explanatory variables being constrained to their mean values. For a continuous variable, the predicted probability is evaluated at ± 1 standard deviation from its mean. The predicted probability of MIG is .057 when all explanatory variables are set equal to the respective values.

c: Chi-square statistic is with respect to the null hypothesis that the predicted probability of MIG is equal across all groups of a categorical; variable.

d: R^2 is not maximized in the MLE logit model. The calculated R^2 is equal to the percentage difference between the geometric means calculated respectively from the predicted MIG probabilities and the observed sample frequencies for searchers and nonsearchers, taken with respect to one minus the geometric mean of the sample frequencies.

*: 10% level of significance two-tailed test.

**: 5% level of significance two-tailed test.

***: 1% level of significance two-tailed test.

TABLE 12

LOGIT COEFFICIENTS ON THE PROBABILITY OF MARRIED MALES MOVING: 1974-1976

(absolute value of asymptotic t ratios in parentheses)

Variable	Logit Coefficient[a]		Predicted Probability[b]	(MIG)	Chi-square[c]
Overall E/POP	-3.482	(0.72)	.033,	.023	
Community Income	-.018	(0.15)	.028,	.026	
Community Type					3.75
Rural	-.634	(1.46)		.015	
Small City	.210	(0.69)		.034	
Medium City	-.211	(0.40)		.022	
Large City	.584	(1.46)		.048	
V. Large City	.426	(0.66)		.041	
Parents' SES	.321	(1.50)	.022,	.034	
YRS Duration in HS Residence					1.05
> 18	-.034	(0.15)		.026	
11-18	-.043	(0.11)		.026	
5-10	-.074	(0.16)		.025	
3-4	.550	(1.00)		.047	
≤ 2	-.160	(0.21)		.023	
Counselor-Student Ratio	-.175	(0.15)	.028,	.026	
%HSGs in College	-.004	(0.32)	.029,	.025	
%HS Dropouts	-.025	(0.88)	.033,	.022	
HS Program					.38
Gen/Academic	.106	(0.62)		.030	
Voced	-.191	(0.62)		.023	
HS Grade Average	-.044	(1.14)	.036,	.021	
HS Leader					4.53**
Yes	.683	(2.13)**		.053	
No	-.247	(2.13)**		.022	
Rec'd Degree: 10/73-10/74					.33
Yes	.251	(0.57)		.035	
No	-.041	(0.57)		.026	

(Continued)

TABLE 12 (Continued)

Variable	Logit Coefficient[a]		Predicted Probability[b] (MIG)		Chi-square[c]
Average Aptitude Score	.057	(1.37)	.019,	.039	
Race					.05
Nonwhite	-.135	(0.23)		.024	
White	.029	(0.23)		.028	
Spouse's Ed					3.31
<HS	.186	(0.38)		.033	
HS	.007	(0.04)		.028	
HS & Voced	-.786	(1.36)		.013	
≥ College	.611	(1.29)		.049	
Spouse's Empl. Status					.11
Employed	-.094	(0.33)		.025	
Not Employed	.109	(0.33)		.030	
Ratio of Spouse to Family Income	3.068	(0.87)	.015,	.049	
Ratio of Spouse to Fam. Ins.-Sqd.	-1.616	(0.31)	.032,	.023	
Respondent's Empl. Status-10/74					.07
Employed	.011	(0.27)		.028	
Not Employed	-.271	(0.27)		.021	
Search Status: 10/74					.07
None	-.236	(0.50)		.022	
Searching (S)	.344	(0.68)		.038	
Willing to Move (M)	.366	(1.19)		.039	
S and M	-.389	(1.19)		.019	
Own Wkly Earnings: 1974	-.009	(0.07)	.028,	.027	
# Jobs: 10/73-10/74	-.013	(0.28)	.029,	.026	

(Continued)

TABLE 12 (Continued)

Variable	Logit Coefficient[a]		Predicted Probability[b] (MIG)		Chi-square[c]
# Wks. Empl. 10/73-10/74	-.021	(0.85)	.033,	.023	
Past Moves					46.59***
None	-.414	(6.56)***		.018	
One Move	2.676	(5.23)***		.290	
Repeat Moves	3.146	(3.95)***		.396	
Return Moves	1.579	(1.65)*		.120	
Constant	.251	(0.07)			
R^{2d} =	.001				
Chi-square[c] =	105.34***				
N =	580				

a: Coefficients for categorical variables indicate group differences from the sample mean and are standardized so their weighted sum equals zero.

b: Predicted likelihood of MIG is conditional on other explanatory variables being constrained to their mean values. For a continuous variable, the predicted probability is evaluated at ± 1 standard deviation from its mean. The predicted probability of MIG is .027 when all expalantory variables are set equal to their respective mean values.

c: Chi-square statistic is with respect to the null hypothesis that the predicted probability of MIG is equal across all groups of a categorical variable.

d: R^2 is not maximized in the MLE logit model. The calculated R^2 is equal to the percentage difference between the geometric means calculated reseptively from the predicted MIG probabilities and the observed sample frequencies for searchers and nonsearchers, taken with respect to one minus the geometric mean of the sample frequencies.

*: 10% level of significance, two-tailed test.

**: 5% level of significance, two-tailed test.

***: 1% level of significance, two-tailed test.

number and purpose of recent location changes are not as relevant in forecasting subsequent changes for single persons as for married persons.

F. SUMMARY OF THE EMPIRICAL RESULTS

The migration analysis for the two time periods provides a number of new insights into what prompts young persons to move. The analysis extends the results of previous research in its focus on youth, by stratifying the sample by sex and marital status of the respondent, and by including several explanatory variables that have heretofore been ommitted all together. The results for the two periods are as follows.

First, despite repeated attempts to discover potential interaction effects, race did not appear to play a significant role in influencing migration, either by itself or in conjunction with other variables. There were some scattered male-female differences, but by and large, the estimates are more supportive of a neutral effect. In general, there is little in our conceptual model that would lead to widespread race-sex differences after controlling for other factors. The empirical results tend to support the idea that race-sex differences are not widespread.

Second, recent high school graduates exhibit a pronounced degree of responsiveness to labor market signals, especially as measured by the local employment-population ratio. This finding is important in demonstrating that youth are aware of market opportunities and behave accordingly. These results stand in contrast to some earlier research findings which indicate that young persons are ignorant of relevant labor market information and/or do not act in a rational fashion. While the estimates cannot tell us whether or not the behavioral responses are optimal, they do suggest that education and labor policies designed to provide more/better market information will have a positive impact because the basic behavioral response is present.

Third, the historical movement away from rural areas is not taking place during the 1972-76 period under investigation. Migration away from sparsely populated areas is no more likely than what occurs for the average sample member (in fact, it is less likely for married households), although smaller cities tend to lose young people and larger metropolitan areas tend to retain young people.

Fourth, the socioeconomic background of graduates has a positive influence on migration that persists over the four years following high school. Just as family SES seems to influence other forms of behavior, such as educational and labor market attainment, so the home environment represented by the SES variable also imparts a lasting influence via the likelihood of moving.

Fifth, the number of years in residence at the 1972 high school location exerts a strong impact on the probability of migration. This empirical finding provides an intriguing link between past geographic mobility as a dependent family member and future mobility as an independent household unit. This result represents the first time that the hypothesized tie between childhood migration and subsequent movement as a young adult has been demonstrated empirically. The relationship indicates that mobility, to a certain extent, represents an acquired predisposition due possibly to increased knowledge and decreased psychological inhibitions to moving away from a known environment. A second and equally relevant explanation for this impact is that location-specific assets (friends, knowledge of local job vacancies) are related to the length of time that someone has resided in a single location.

Sixth, and similar to the above, a recent move (between June 1972 and October 1974) is strongly correlated with a future move (between October 1974 and October 1976). Part of this tie may be explained by an unobserved mobility preference, and part may be due to place-specific investments in information and friends that are undoubtedly related to years in residence. The smaller are the place-specific assets, the lower the costs of moving.

Seventh, the high school experience has an influential role in stimulating migration which, however, appears to diminish overtime. Both the social and institutional environment of the high school, when taken as a whole, suggest that access to job-location information is a significant determinant of geographic mobility. The college attendence of former students, staff-student ratios, and participation in special educational programs provide a consistent pattern of evidence that the school environment is influential and can be altered so as to encourage or discourage migration.

Eighth, there are significant differences between single and married respondents. For males, marriage inhibits mobility, while for females, the opposite is found. The former relationship is consistent with _a priori_ expectations in that husband-wife families are likely to be more socially and economically integrated into the local area, thus increasing the opportunity costs of a contemplated move. The latter association might be explained by the tendency of single females to stay close to relatives for socioeconomic support and to move away with their husbands when they do marry (their husbands may have unobserved characteristics that would dictate a move).

Ninth, verbal and mathematical aptitude, as measured by several short tests in 1972, is estimated to play a significant role in explaining the occurrence of long-distance moves. This finding is consistent with the maintained hypothesis that the ability to acquire and assess job opportunities in distant locations is a critical element that underlies the likelihood of migrating.

Tenth, labor force status and employment experience during the recent past have a substantial impact on the probability of moving. Individuals without jobs, few weeks of past employment, and low wages are more likely to move than employed, higher paid workers who have strong employment ties in the origin labor market. All of these estimated effects reinforce the notion of economic opportunity costs and underscore the strong interrelationship between labor market behavior and geographic mobility. The estimated importance of current job search and a willingness to relocate to obtain a job contribute to the argument that job-location changes represent an important behavioral nexus that warrants further investigation by researchers.

FOOTNOTES

1. Because there were four surveys administered, we could have divided the 4 ½ year period into three sections. However, it was concluded that little extra insight would have been gained.

2. A single exception is that the occurence of a marriage is used to predict migration. This variable is not crucial to the analysis, but is used to test an hypothesis asserted by Mincer (1978) that migration and recent marriage are positively correlated. Because causality almost certainly runs from marriage to migration, there is no danger of simultaneity bias in including the former as an explanatory variable. With regard to using the estimated model to predict migration for policy programs, the "recent marriage" term would have to be excluded because it is not observable.

3. A disadvantage of using 1970 Census data is that changes over time are not captured. This becomes a problem when the labor market differences recorded in 1970 cease to be valid due to variable shifts in local economic conditions. However, there are no available data that measure such changes with the exception of major U.S. cities. It is our contention that significant structural differences among local labor markets in 1970 are likely to persist until 1975 and for the purposes of interarea movement, the strutural cross-section variation is more important than temporal intra-section variation.

4. Community income was calculated by multiplying the midpoint of each income interval by the respective number of families for each three-digit zip code area. To the extent that young workers are subject to money illusion, the use of a nominal rather than real income measure is warranted. Unfortunately, the data do not permit a test between real and nominal income measures.

5. The SES variable is a continuous index composed of parental income, father and mother's educational attainment, father and mother's status, and certain characteristics of the home environment such as reading material, cars, presence of televisions, dishwashers, and so forth. The index is useful not only in capturing the general notion of socioeconomic status, but its construction permits us to retain a large number of observations that ordinarily would have been eliminated because of missing data, had the SES components been used separately.

6. In the 1972-1974 migration analysis, we experimented with different E/POP variables which were measured separatly for whites and non-whites and for males and females (rather than using a four-way classification). Also attempted were measures for all 16-21 year olds, 16-21 year olds out-of-school, and an E/POP with respect to the overll three-digit population. Of interest is that the more

precisely was the E/POP measured for the sample subgroups, the greater the level of statistical significance. In fact, for most of the more general measures, the estimated coefficients were insignificant.

CHAPTER VI

THE EMPLOYMENT AND EARNINGS IMPLICATIONS OF YOUTH MIGRATION

A. INTRODUCTION

This chapter examines two important economic implications of youth migration: (1) the impact on employment, and (2) the impact on wage growth experienced during the third and fourth years following high school graduation (October 1974 to October 1976). In this focus on the effects of geographic mobility, this chapter represents the sequel to Chapter V which examined the causes of youth migration. In what follows, the sample is described in section B, some key methodological issues are identified in section C, the employment analysis is discussed in section D, the wage analysis is presented in section E, and the results are summarized in section F.

The social importance of migration is predicated on its hypothesized role as an equilibrating mechanism. This observation holds regardless of whether geographic mobility is viewed as a safety valve to release social pressures due to overcrowding, as an activity to redistribute demands for political, social, and environmental services, or as mechanism to allocate human resources to their most productive uses. Our study concentrates on the latter phenomenon in an effort to determine if workers move from areas with low job opportunity and low wage rates to labor markets offering more favorable conditions for working. According to the competitive theory of the labor market, individuals move from one location to another in order to make themselves better off. To the extent that this occurs, both households and the overall economy reap pecuniary and/or nonpecuniary benefits (apart from externalities). However, under conditions of imperfect information, the viability of migration as an efficient allocative mechanism cannot be assumed. In fact, the question of whether or not workers recognize, learn of, or respond to market signals has been a major stimulus to the development of search models which have been used to analyze both the determinants and implications of search, quit, and migration activity (see Chapter III). Chapter V investigated the causes of migration and found that recent high school graduates exhibit a significant sensitivity to local labor market conditions, their labor force experience, and personal characteristics in forming their mobility decisions. However, movement away from the origin is only half the story, for if migration is to pay, the choice of the destination must lead to a positive net gain. If so, then migration can be viewed as a productive activity, undertaken at a cost, but yielding a positive return.

The time period of the analysis is bounded by October 1974 and October 1976. The employment section examines the probability of being employed in October 1976, especially with respect to the impact of migration occuring between the 1974-76 period. Transition rates between one employment status and another are also estimated. The wage analysis examines the two year percentage change in wage rates that took place between October 1974 and October 1976. In general, the principal findings of these two analyses offer strong empirical support that migration yields a positive benefit to young persons undertaking a move.

B. SAMPLE AND DESCRIPTIVE STATISTICS

1. Sample

The focus of this analysis is the economic repercussions of migration undertaken by recent high school graduates. Hence, all members of the sample had to have graduated from high school no later than September of 1972. Because the orientation is toward labor market experiences in the private sector, the study excludes persons from the sample who were in the military. For the employment analysis, the military filter is imposed for October 1976. For the wage change analysis, the military filter is applied to both October 1974 and October 1976 in order to concentrate on wage growth that is not confounded by a switch in military status. In the wage change analysis, persons were required to have been employed at both end points of the period (as well as have valid wage and hours data), in order to construct a percentage wage change variable.

As discussed below in Section C, the impact analysis is subject to two methodological problems that have required considerable additional analysis in order to avoid potentially biased results. To keep the project to a manageable size, we have limited the sample in this chapter to persons who were reported to have been single as of October 1976 (including separated, divorced, or widowed individuals).

Finally, the sample has been further winnowed by eliminating cases with missing responses to survey questions used in the analysis. The major cause of missing response was that over 5,000 persons missed the 1972 survey, which contained a series of test equations used to construct an average aptitude score. This sample restruction also serves to maintain rough comparability between the samples used in the determinants and implications of migration analysis.

2. Descriptive Statistics

In tables 13 and 14, descriptive statistics are presented. Because the samples used in the employment and wage analyses differ (primarily because the latter imposes an October 1974 employment requirement), the samples vary considerably in size. Therefore, separate sample statistics are presented for the variables used in the respective analysis sections.

Although the following statistics are generally self-explanatory, a few observations should be made. First, the E/POP variable is constructed with 1970 Census data and it measures the employment-population ratio for all persons aged 14 years and over within the three-digit zip code in which a respondent lived as of October 1976. Because of the elapsed time since the 1970 Census, it was decided to restrict our measure to one that (1) better reflected the typical age of the NLS-72 class (most were about 22 years of age), and (2) was less susceptible to temporal fluctuations because of the larger population base used to construct an overall E/POP as opposed to an E/POP based only on the 16-21 year old population within each three-digit zip code.

Second, the reader should be reminded that the NLS-72 sample is drawn more heavily from the South and North Central regions than from the Northeast and West. Also, the sample tended to reside, as of their senior year in high school, in relatively less populated areas than the general population. In the analysis, an effort was made to account for this geographic distribution, but the control variables often proved to be of little statistical significance.

With regard to the employment analysis, table 13 provides some interesting descriptions. The proportion of employed persons rises from 78 percent in October 1974 to 86 percent in October 1976. However, this apparent increase is due primarily to the sample filter (non full-time students) that was enforced only for the later date. Approximately 14 (16) percent of the sample migrated over 100 (50) miles during the two year period. Less than one-half of the moves were reported to be for job-related reasons, while the remainder were made for other reasons (personal, geographic preferences, school). Job transfers made up only a very small number of all moves. A considerable fraction of the sample had earned some form of postsecondary education (PSE) degree by October 1976, with certificates being the most frequent PSE attainment. Finally, the predicted probability of migrating over 100 miles between October 1974 and October 1976 for the sample is 14 percent, a figure that is in close accord with the actual sample proportion. The predicted value is based on the Chapter V results and is used in this chapter as an instrumental variable to control for potential endogeneity (see section C).

With regard to the wage change analysis, the sample statistics are presented in table 14. Note that the sample size has dropped considerably, from 4157 cases in the employment analysis (3587 of whom were employed in October 1976), to 2196 (a drop that largely reflects the October 1974 employment requirement). The average hourly wage rate was $3.00 at the beginning of the two-year period and $3.88 at the end, representing an average gain of $.79 or a 25.6 percent increase (or equivalently, a continuous annual growth rate of 11.4 percent). For recent high school graduates who remained employed, the data suggest that this subset of young workers fared relatively well in the labor market. The standard errors associated with the above mean values, however, indicate that the favorable wage rates and wage growth were by no means uniform across the sample.

TABLE 13

DESCRIPTIVE STATISTICS FOR THE OCTOBER 1976 EMPLOYMENT ANALYSIS
(Sample proportions or means with standard deviations in parentheses)

Variable	Statistics (n=4159)	
Zip Code E/POP Ratio	0.56	(0.05)
Zip Code Community Income ($1000s)	11.33	(2.30)
Community Type - 1976		
Rural	0.17	
Small City	0.24	
Medium City	0.20	
Large City	0.23	
Very Large City	0.16	
Parents SES	-0.01	(3.53)
Race/Sex		
Nonwhite Male	0.11	
Nonewhite Female	0.13	
White Male	0.41	
White Female	0.34	
High School Program		
General/Academic	0.70	
Voced	0.30	
Average Aptitude Score	49.01	(7.33)
High School Grade Average	76.35	(6.62)
High School Leader	0.25	
Earned PSE Certificate	0.16	
Earned PSE License	0.07	
Earned PSE Voced Degree	0.06	
Earned PSE Jr. College Degree	0.06	
Earned PSE "Other" Degree	0.03	
Migration > 100 miles (October 1974-October 1976)		
Job Related Move	0.05	
Job Transfer	0.01	
Other Reason	0.08	
No Move	0.86	

(Continued)

TABLE 13 (Continued)

Variable	Statistics (n=4159)
October 1974 Employment Status	
Student, Employed	0.17
Student, not Employed	0.12
Non-student, Employed	0.58
Non-student, not employed	0.10
In the Military	0.03
Migration during 6/72-10/74	
None	0.80
1 Move	0.15
2 Moves-repeat	0.02
2 Moves-return	0.03
Employment/1974-76 Migration Status	
Employed, job related move	0.03
Employed, job transfer	0.01
Employed, other reason for move	0.05
Not Employed, job related move	0.02
Not Employed, other reason for move	0.02
Employed, no move	0.68
Not Employed, no move	0.18

SOURCE: Mathematica Policy Research, Inc.

TABLE 14

DESCRIPTIVE STATISTICS FOR THE OCTOBER 1974 - OCTOBER 1976 WAGE CHANGE ANALYSIS

(sample proportions or means with standard deviations in parentheses)

Variable	Statistics (n=1773)
Log (W-74)	1.13 (0.37)
Actual W-74	3.08 (1.44)
Log W-76	1.35 (.37)
Actual W-76	3.87 (1.44)
Nonwhite Male	0.11
Nonwhite Female	0.09
White Female	0.36
(White Male)[a]	0.44
General/Academic HS Program	0.65
(Voced HS Program)	0.35
Socioeconomic Status of Parents	-0.18 (0.62)
Aptitude Score	48.88 (6.80)
Earned PSE Certificate	0.16
Earned PSE License	0.07
Earned PSE Voced Degree	0.04
Earned PSE Jr. College Degree	0.04
Earned PSE Other Cert./Degree	0.03
No. Weeks Employed - 10/73 to 10/74	45.14(13.15)
No. Weeks Employed - 10/74 to 10/76	92.87(19.20)
10/76 Job Started in 1975	0.16
10/76 Job Started in 1976	0.28
(10/76 Job Started before 1975)	0.57
1972-74 Migration, Job Start < 1975	0.04
1974-76 Migration, Job Start in 1975	0.01
1974-76 Migration, Job Start in 1976	0.04
(No 1972-74 Move, Rural Resident)	0.45
No 1972-74 Move, Urban Resident	0.45
R → R 1972-74 Move, Urban Resident	0.03
R → U 1972-74 Move	0.03
U → R 1972-74 Move	0.01
U → U 1972-74 Move	0.03
(No 1974-76 Move, Rural Resident)	0.43
No 1974-76 Move, Urban Resident	0.52
R → R 1974-76 Move	0.01
R → U 1974-76 Move	0.01
U → R 1974-76 Move	0.01
U → U 1974-76 Move	0.02
Lambda	0.69 (0.20)

SOURCE: Mathematica Policy Research, Inc.

[a] Dummy variables excluded from the regression equation are in parentheses.

Also of interest are the job experience variables. Over 40 percent of the sample started their October 1976 job during 1975 and 1976, suggesting rather short tenures for a large segment of the sample. The average weeks of employment during the 1974-76 period (46 weeks) indicates that, on average, almost 15 percent of the year is spent without a job.

C. METHODOLOGICAL ISSUES

The purpose of this chapter is to estimate the impact of migration on two measures of labor market experiences, employment and wage growth. The most straightforward approach is to specify employment and wage rate equations and to regress the observed dependent variables on respective vectors of independent variables, including migration. The coefficient estimated on the migration dummy variable could then be interpreted as the predicted mobility impact. Despite the attractiveness of such a direct approach, a simple comparison between migrants and nonmigrants based on a linear regression model (in the case of wage change) or logit model (in the case of employment) is subject to posible "selectivity bias" from two distinct sources. The first of these problems affects both the employment and wage change analyses. Basically, it arises from the fact that in the decidedly non-experimental setting of the labor market, the "treatment" of migration is based on self-selection. One would like to be able to interpret the coefficient of the migration variable in the wage change model as an indicator of what would have happended to nonmigrants had they migrated, and vice versa. If the propensity to migrate is affected by unobservable factors that are also correlated with employment and wage levels, then misleading inferences may follow from standard statistical analysis.

In the case of migration the direction of bias is unclear. On one hand, the estimated effect of migration may be biased upward because the persons who choose to migrate are precisely those who have the most to gain from migration, in terms of both employment and wage opportunities. This scenario is suggested by the traditional theory of labor markets. On the other hand, the persons who are most mobile may be those who would have experienced relatively poor labor market opportunities whether or not they moved, on account of, say, low human capital. If these determinants of labor market opportunity are partly unobservable, as is almost surely the case, downward bias will result. It may also be the case that both of these effects are in play, but effectively offset one another.

Wu (1973) has developed a statistical test for the presence of these effects. It consists simply of including both the actual and predicted values of the migration variable as regressors, and then performing a standard statistical test on the coefficient of the predicted value. We applied this test, using predicted values generated by the results presented in Table 10 in Chapter V.

The second selectivity problem pertains only to the wage change analysis. Because the estimation focuses on observed wage rates, persons who were without jobs at either the beginning or the end of the period are necessarily excluded. Traditional labor market theory posits that the probability of employment is systematically correlated with the wage rate. When the sample to be analyzed is selected on the basis of the value of the dependent variable or another variable that is correlated therewith, all estimated coefficients are potentially biased and inconsistent; the direction of bias is generally indeterminate.

Heckman (1979) suggests a technique which can be used to obtain consistent coefficient estimates; this technique is explained in detail in Appendix B. Basically, the technique consists of first estimating a sample inclusion equation and then using the estimates to construct a new independent variable that corrects for differences in the probability of being in the sample. In our case, this is the joint probability of being employed, not a full-time student, and nonmilitary for both October 1974 and October 1976. By controlling for this source of sample selectivity, the migration coefficient estimates the direct impact on wage change, conditional on a worker being employed.

D. IMPACT OF MIGRATION ON THE PROBABILITY OF EMPLOYMENT

1. General Discussion

This section focuses on the likelihood of employment as of October 1976. The analysis examines the influence of a number of factors that include family background, high school experience, demographic characteristics, and human capital investments such as postsecondary education and recent migration. The analysis also estimates transition rates between October 1974 employment status and October 1976 employment.

The probability of an individual being employed at a point in time is a function of a number of influences. Conceptually, this probability can be modeled within a job search framework in which potential workers and firms are presumed to be looking for suitable matches. Concentrating on worker behavior, Chapter IV develops a model of job-location search and mobility, where individuals are presumed to set a minimum acceptable wage rate which a job offer must exceed in order to be acceptable. The optimal acceptance wage is determined by a number of factors, including market conditions, individual discount rates, search ability, and expectations of the returns to search activity. The value of wage offers expected to be elicited through the search process are largely dependent on an individual's endowment of marketable skills (i.e., human capital).

Within this context, if an individual is observed to be employed, then it is assumed that some wage offer was found that was also acceptable. The converse would hold if a worker were not employed. Hence, the probability of employment can be interpreted as the probability that a worker encounters an acceptable job offer. The dichotomous employment variable is used as the dependent variable in place of wage offers and acceptance wages because the latter are unobserved in the data.

The above discussion provides a framework within which to motivate and interpret an employment equation. In general, factors that encourage an individual to search and affect the likelihood that a given search effort will lead to employment, can be grouped into several major components. In the discussion that follows, (1) the hypothesized relationship between these factors and employment are discussed, (2) the empirical measures are described, and (3) the empirical results are interpreted. The primary lines of inquiry consistent with the above are:

- Impact of local economic conditions
- Role of family background and personal characteristics
- Role of high school experience/performance
- Impact of postsecondary education
- Employment transition rates
- Influence of migration

2. Dependent Variable Estimation Technique

For our sample, 86 percent were employed in October 1976. Recall that the sample excludes full-time students and military personnel, although part-time students are included. The sample proportion, however, masks the lower employment among nonwhite females of 78 percent which contrasts with nonwhite males, white males, and white females (84, 88, and 87 percent, respectively).

Because of the statistical problems in using a dichotomous dependent variable in a regression equation, a nonlinear procedure should be used. We use a logit model (a probit routine is equally valid and produces nearly identical results), which is a maximum likelihood routine that predicts an S-shaped curve bounded by 0 and 1, and produces efficient and unbiased parameter estimates (see Appendix A for further discussion).

The estimated logit results are presented in the following tables. To help the reader in using the tables, several points that were made in Chapter V should be reiterated here. First, the employment equations are estimated by a logit model in which the dependent variable actually used is the log-odds of being employed (E):

$$\log_e \left[\frac{\Pr(E)}{1-\Pr(E)} \right] = XB$$

$\overset{(nxk)}{X}$ = data matrix

$\overset{(kx1)}{B}$ = vector of coefficient parameters.

Because the estimated parameters in column one of the tables are with respect to the log-odds of being employed, they cannot be interpreted directly as the change in the probability of employment, Pr(E), in response to a unit change in an independent variable. However, the log-odds of employment is a monotonic transformation of Pr(E); hence, the estimated coefficients do indicate the direction of change for Pr(E).

Second, to facilitate drawing inferences from the logit estimates, the predicted probabilities of employment have been calculated for plus and minus one standard deviation from the mean of each independent variable (or predicted group probability for categorical variables), conditional on all other explanatory variables being constrained to their mean values. The predictions are noted in column two of the tables. Third, the coefficients on each categorical variable have been estimated so that their respective weighted sums equal zero. Hence, there is no excluded group and the coefficients measure the differences from the sample proportion. The asymptotic chi-square statistic for each categorical variable in column three summarizes the test of equality of coefficients across categories.

3. Sample Selectivity

As discussed earlier, there is an implicit second equation underlying the probability of employment equation namely, the decision to migrate. Ignoring the potential endogeneity that exists may result in biased coefficients estimated in the employment equation. To circumvent this problem, an instrument for October 1974--October 1976 migration is created on the basis of the logit model results described in chapter V. The results are used to create a predicted probability of migration variable for each sample member.

To test for the endogeneity of the migration variable, the employment equation is estimated with both the actual and the predicted migration variables. Following Wu (1973), Hausman (1978) and Kiefer (1978), the statistical significance of the coefficient of the predicted migration variable will indicate whether or not the true migration value is correlated with the error term in the employment equation. This test was conducted and the null hypothesis of zero correlation between observed migration and the disturbance term in the employment equation, could not be rejected, as the asymptotic t ratio of the predicted migration coefficient was .51. Therefore, subsequent runs were estimated without the predicted migration value. Not surprisingly, both the coefficients and standard errors of other explanatory variables remained virtually unchanged when the employment equation was reestimated without the instrumental variable.

4. Interpretation of Empirical Results

Prevailing local economic conditions are an important theoretical determinant of employment because the level of economic activity affects the behavior of both workers and firms. On the one hand, slack conditions have been shown to discourage quit activity and discourage entry into (and encourage dropping out of) the labor force because of fewer job vacancies. On the other hand, a slack market increases the chance of firms laying off workers, reducing the real wage rate offered to job applicants. These actions, in turn, influence worker search decisions. In combination, the reactions of workers and firms to economic conditions affect the probability that a person in our sample will be employed.

To test for this relationship, several empirical measures were used. The first is a measure of local labor market tightness, the employment-population ratio (E/POP). This variable is based on 1970 Census for all persons aged 14 years and over, and is constructed for each three-digit zip code area (approximately 900 in the U.S.). An overall E/POP is used in place of a more narrowly defined ratio (i.e., 16-21 year olds) because the typical age of our sample is 22 by 1976, and most have entered the economic mainstream. A second measure of the local economy is the average annual family income calculated with 1970 Census data for each three-digit zip code. The purpose of this variable is to capture community wealth or income which should manifest itself in the derived demand for local labor. A third measure of the local labor market is the population size of the 1976 locality of residence. This variable, obtained from the NCES data, is intended to control for the influence of the size and possible diversity of the geographic area on the likelihood of employment.

As indicated by the logit results, the labor market variables performed poorly as predictors of employability. Because previous research has provided substantial verification that economic conditions do matter, our results should be discounted heavily. Two explanations for the lack of significance are: first, the 1970 Census data may be sufficiently outdated, especially in light of the recent (1974-75) recession, so that our measures are inaccurate gauges of local variation in economic conditions. Second, it is possible that even if the first problem did not exist, the effect of local labor market conditions may have been dominated by the overall conditions for the national economy. Without a longer time frame and better data we cannot distinguish between these two hypotheses. City size is also a poor predictor of employment, although residents of very large metropolitan areas tend to have a lower chance of being employed than similar persons in other localities.

The role of family background and demographic characteristics is examined with an index of the parent's socioeconomic status (SES) and by the race and sex of the respondent. SES is based on parental income, education, occupation, and certain aspect of the home environment. As of 1976, however, a young person's socioeconomic background does not appear to inhibit or facilitate employment. This lack of an effect, if replicated with other data and in different time periods with the NCES file, could be interpreted as good news in that a disadvantageous background does not seem to foreclose future employment possibilities. But this is only part of the story, of course, because an individual's labor market success is heavily determined by wage rates, hours of work, and job stability. The latter, however, are not the subject of this study and must be left aside for other research.

The sample statistics indicated that nonwhite females had a much lower percentage of employment than the other three race-sex groups. After controlling for other sources of individual variation, nonwhite females had a significantly lower predicted probability of employment (.85) that was much closer to the sample proportion. White males had a significant, but only slightly higher predicted employment percentage of .90 than the sample proportion.

The high school experience provides an interesting view of particular components of human capital. An individual's stock of human capital is (1) a relevant determinant of search ability, hence the chance of a successful job hunt, and (2) as a measure of productive skills and ability to learn new skills. Empirical measures used to capture this general effect include high school grades (overall grade point average), high school course of study (academic/general, voc-ed), tested aptitude (average score over six tests administered in the 1972 NCES survey), and high school leadership (whether or not a respondent was a leader in one or more clubs, government, or other school organizations).

Of the four high school experience variables, all but the course of study are statistically signficant determinants of employment. The high school grade average has a positive affect on P(E), although it is somewhat difficult to interpret exactly what the relationship means. From one prespective, better trained graduates, as implied by higher grade averages, are better able to seek, find, retain jobs and/or are considered by potential employers to make better employees. In this sense, high schools have an important role in preparing students for their entry and participation in the labor force. From another perspective, the positive employment-grades association may not be due to the apparent mastering of school material, but rather, it may reflect the innate motivation of individuals to perform well in high school, an attitude that may continue to persist in the labor market. Even in this second, more nebulous case, the high school may have an important role to play by attempting to motivate students to excel.

The argument that grades largely reflect inherent intelligence is not as strong an issue in our case because we include a measure of aptitude in the analysis. However, we cannot disentangle the respective weights to attach to inherent ability and to that imparted by the school system (family background is held constant but the nature of the peer group, another source of informal learning, is not). In any case, the estimated coefficient on aptitude is positive, which is consistent with the a priori expectation that both search ability and marketable skills are important factors governing the employability of young persons.

Past experience as a high school leader suggests another facet of human capital that is relevant in future employment. Again, interpretation of the positive relationship is tricky for reasons analogous to those mentioned earlier. On one hand, leadership abilities developed in high school may lead to the evolution of a more organized and motivated type of person who is more likely to conduct a more efficient job search and/or have a personality that is attractive to a potential employer (as evident in an interview or an application). On the other hand, the personality traits that may be linked to high school leaders may be innate. Regardless of the source of explanation, the high school extracurricular experience can be viewed either as an important source of personal development, or as a signal to firms of useful skills other than those connoted by aptitude (academic success).

Postsecondary education (PSE) is presumed to have a positive impact on subsequent earnings. The decision to enroll and possibly complete a PSE program can be viewed as a decision to invest time and money resources to obtain better skills (additional human capital), thereby increasing one's value to a prospective firm. Therefore, we expect the acquisition of PSE training to lead to higher wage rates. The impact of PSE on the incidence of employment, however, is not so clear-cut. If PSE attendance/completion leads an individual to raise his acceptance wage rate, below which he will not accept a job offer, then the chances of becoming employed may diminish. Theoretically, the impact is ambiguous for several reasons. First, the magnitude of the PSE effect on the acceptance wage is uncertain. Second, and more importantly, a PSE program may shift the entire wage offer distribution facing a worker because the acquired skills may lead to both higher wage offers and new types of jobs for which he or she was previously unqualified.

In the empirical model, the impact of PSE on employment is examined only at a superficial level. Because our focus is on migration, we have left the necessarily more sophisticated specification to another endeavor. For our purposes, the earning of a PSE certificate or degree by October 1976 is used primarily to control for investments in human capital. Our specification is not intended to estimate how post-high school training affects employment. However, the estimated coefficients do imply that PSE programs may have a positive impact on the probability of employment. For persons earning a certificate, voc-ed degree, or junior college degree, the chances of being employed are significantly greater than the sample proportion. Of the programs included, the employment differential between voc-ed graduates versus nongraduates appears to be the widest (a predicted probability of employment of .94 versus .88), ceteris paribus.

An individual's employment tends to persist over time, although such a general observation does not provide much insight without knowledge of the various transition rates from one employment status to another. To examine this more systematically, the initial status is included as an independent variable: employed-not employed, military-nonmilitary, and student-nonstudent as of October 1974.

The empirical results in table 15 are quite revealing. Persons previously employed in the private sector, regardless of their previous student status, are considerably more likely to be employed in October 1976 (about 91 percent) than other similar persons. Students who previously were not employed have a lower estimated probability of 83 percent. Among those who were neither students nor employed workers in the base period, the predicted probability of being employed is a dismal 69 percent. Thus, individuals who were either working and/or acquiring postsecondary training seem to fare well in the labor, while those who were neither gaining work nor training experience, appear to encounter significantly greater obstacles in obtaining employment. Persons who were in the military in October 1974, but left the armed forces during the 1974-76 period, also have a significantly lower probability of employment (.79) than the sample proportion.

The analysis, however, has not been designed to answer why this situation exists, a question that is relevant in formulating remedial youth policies. Part of the explanation may stem from preexisting (prior to October 1974) personal factors that are not captured by other explanatory variables in the equation. For example, lack of motivation, poor skills, and unsatisfactory work experiences may depress the desire or ability to seek employment. Another related explanation may stem from the employer side of the labor market. If firms view past unemployment and job instability as signals of undesirable worker characteristics, then they will be less likely to make job offers to such persons.

The influence of migration can also be couched in a human capital investment framework. By migrating from one location to another, individuals are able to determine the type of labor market in which they plan to participate. As discussed previously, an important part of this research is to determine whether or not youth migration is motivated by market conditions existing in the origin locality. And indeed, we found a significant and positive response. Now we look at the outcome of those migration decisions: Is the decision to invest time and money into moving from one area to another worthwhile in terms of enhancing the probability of employment? This is the central question of our analysis.

Theoretically, we anticipate that for individuals who move for job-related reasons (this is the relevant type of movement for our model of income maximization), there should be an increase in earnings in the destination over that of the origin to offset the financial and psychic costs of relocating. Given the lack of perfect and easily accessible labor market information, however, this prediction cannot be accepted without empirical verification. Furthermore, as in the postsecondary education case, we cannot predict unambiguously, the impact of migration on employment in the destination location. To the extent that young persons act in accordance with the job/location search model, theory predicts a positive wage impact. The employment effect, however, is ambiguous a priori, because we are unable to forecast the change in a migrant's acceptance wage versus the change in the likely wage offer in the destination location.

Empirically, there is a substantial difference between persons who migrate for nonjob reasons (school, personal, environment) and all other movers and nonmovers. In October 1976, 87 percent of the immobile portion of the sample was observed to be employed, 89 percent of all job-related movers were employed, 82 percent of those reporting job transfers, but only 68 percent of the migrants who moved for nonjob reasons were employed (recall that full-time students are excluded from the sample). Because nonjob migration is not explicitly modeled in our analysis and because the data do not provide a set of variables with which to examine its noneconomic implications, we distinguish between job and nonjob migration. It should be noted parenthetically that the reason for migration is an ex post response. Hence, it may be influenced to an unknown degree by whether or not the respondent considered the move to be "successful", an evaluation that may depend on the post-move employment status.

When the above distinction is not made and a simple 0-1 migration dummy is included in the logit equation, a significantly negative coefficient is estimated. Recognizing the distinct motivational difference between job-related and other moves, separate coefficients were estimated, as noted in table 15. Also controlled for in the estimation is the prior (October 1974) employment status, although none of the coefficients in the equation are altered when the base period employment variable is excluded. Persons undertaking a move for a job-related reason have a predicted probability of employment of 92 percent versus 89 percent for similar, but immobile workers: a slight advantage of 3 percentage points to moving to a labor market in a new location. While there does not appear to be much difference between the above two groups by conventional statistical standards ($\chi^2 = 2.62$), persons who move for nonjob reasons are significantly much less likely to be employed at their destination (a predicted probability of 71 percent). Persons who move because of a job transfer are estimated to be insignificantly different from the sample employment rate. However, the small number of cases with regard to job transfers limits our ability to draw inference with any degree of reliability.

A second round of estimation was conducted to determine whether or not migration was economically more important for persons who were previously without jobs than for those who were employed. In table 16, estimates are presented which include interacting October 1974 employment status with observed migration, by reason for moving more than 100 miles. The results are almost identical if all moves over 50 miles are used instead of the 100-mile criterion. We use the more stringent, longer-distance measure in order to remain consistent with the probability of migration analysis.

For persons originally employed in October 1974, migration has little perceptible effect on October 1976 employment probability. For persons who move for nonjob reasons, prior employment status does not appear to make much difference to the low predicted probability of employment, although previously employed persons have a slightly higher chance of being employed again in 1976 than similar nonjob movers who were not previously employed. A most interesting finding is that among comparable persons who were initially jobless, job-related migration is associated with a much higher likelihood of employment (89 percent) than for nonmovers (75 percent); a difference that is statistically significant ($\chi^2 = 4.4$). Taken at face value, the estimates suggest that moving for job reasons increases the chance of becoming employed in October 1976 among the jobless to almost the same level as persons who were employed in 1974 (92 percent). Because currently employed workers tend to be employed in the future, and jobless workers are much less likely to be, this finding suggests that migration may play a key role in escaping from areas where young persons are without work.

Jobless students significantly benefited from migration while jobless nonstudents experienced insignificantly greater incidence of employment than similar nonmovers. The predicted probability of employment for jobless students who moved was 96 percent as compared to 83 percent for jobless students who did not move. Second, persons who were neither in-school nor in the labor force fared relatively poorly. With respect to this subgroup, those who moved for job related reasons had a predicted employment probability of 83 percent, while that for comparable nonmovers was 75 percent, although the difference is statistically insignificant ($\chi^2 = .23$).

After controlling for a variety of personal characteristics and PSE degree attainment, migration appears to be an economically important activity that is particularly beneficial to students as they enter the labor force after receiving some form of PSE training. Migration appears to widen the range of job opportunties for these young workers, thereby enhancing their prospects for finding suitable employment and utilizing their newly acquired skills. The fact that nonstudent-nonemployed persons who migrate do not raise their employment potential by a significant margin may be explained by their relative skill deficiency that dampens their employability, regardless of location. While the fairly small number of observations in these latter categories may limit generalization of the results, the findings do point to a subset of recent high school graduates who either do not choose to work and/or face significant obstacles in their attempts to find jobs. Public intervention to provide training, job search assistance, and employment may prove to be most helpful for this subgroup.

In summary, the empirical analysis has found that prior employment and student status are intertwined with migration in affecting future employment. Previously employed persons, regardless of their student status, are likely to be employed again. Furthermore, their chances of being employed do not appear to be influenced by long-distance moves prompted by job-related reasons. Individuals who move for nonjob-related reasons, in contrast, have a much lower incidence of employment, regardless of their prior employment status. Why this is so is unclear, but several possible explanations come to mind. First, those who moved for nonjob reasons may have fared much better had they chosen a destination on the basis of job considerations. Second, this subset of nonjob related movers may weigh noneconomic factors more heavily than economic factors, so that in terms of increasing their utility or satisfaction, they may have performed as well as those who moved for job-related reasons. Our analysis, however, focuses only on the narrower issue of economic outcomes as measured by employment and wage rates. Third, and related to the second point, persons who move for nonjob reasons may have remained out of (or exited from) the labor force so that the apparrent negative impact of migration for this subset is actually a reflection of their labor force participation decision instead of the independent effect of migration on the probability of employment.

TABLE 15

LOGIT COEFFICIENTS ON THE PROBABILITY OF EMPLOYMENT: OCTOBER 1976
(absolute value of asymptotic t ratios in parentheses)

Variable	Logit Coefficient[a]		Predicted Probability[b]		Chi-square[c]
Zip Code E/Pop Ratio	.487	(0.36)	.883,	.888	
Zip Code Community Income ($1000's)	.006	(0.20)	.884,	.887	
Community Type - 1976					2.79**
Rural	.071	(0.63)	.893		
Small City	.050	(0.57)	.891		
Medium City	-.041	(0.44)	.881		
Large City	.047	(0.52)	.890		
Very Large City	-.162	(1.50)	.868		
Parents' SES	.004	(0.33)	.884,	.887	
Race/Sex					10.64***
Nonwhite Male	-.016	(0.12)	.884		
Nonwhite Female	-3.590	(3.02)***	.844		
White Male	.134	(2.20)**	.898		
White Female	-.025	(0.35)	.883		
High School Program					.58
General/Academic	-.025	(0.76)	.883		
Voced	.085	(0.76)	.891		
Average Aptitude Score	.013	(1.63)	.875,	.895	
High School Grade Average	.012	(1.47)	.877,	.893	
High School Leader					5.59**
Yes	.213	(2.36)**	.905		
No	-.071	(2.36)**	.878		
Earned PSE Certificate					3.91**
Yes	.233	(1.98)**	.907		
No	-.045	(1.98)**	.881		
Earned PSE License					.44
Yes	.137	(0.66)	.899		
No	-.010	(0.66)	.885		
Earned PSE Voced Degree					4.76**
Yes	.526	(2.18)**	.929		
No	-.033	(2.18)**	.882		

(Continued)

TABLE 15 (Continued)

Variable	Logit Coefficient[a]		Predicted Probability[a]	Chi-square[c]
Earned PSE Junior College Degree				1.20
Yes	.232	(1.09)	.907	
No	-.015	(1.09)	.884	
Earned PSE Other Degree				.12
Yes	.099	(0.35)	.895	
No	-.003	(0.35)	.885	
Migration > 100 miles (Oct. 1974 - Oct. 1976)				69.86***
Job Related Move	.483	(1.96)**	.926	
Job Transfer	-.643	(1.32)		.803
Other Reason	-1.137	(8.03)***		.713
No Move	.079	(3.86)***		.893
Oct. 1974 Employment Status		164.25***		
Student, employed	.193	(1.59)		.904
Student, not employed	-.416	(3.29)***		.836
Nonstudent, employed	.288	(6.55)***		.912
Nonstudent, not empl.	-1.255	(11.77)***		.688
In the Military	-.725	(2.92)***		.789
Moves during 6/72 - 6/74				.78
None	-.005	(0.20)		.885
1 Move	.062	(0.52)		.892
2 Moves-return	.013	(0.05)		.884
2 Moves-repeat	-.182	(0.71)		.866

(Continued)

TABLE 15 (Continued)

Variable	Logit Coefficient	Predicted Probability	Chi-square[c]
Constant Term	.148	(0.17)	
R^{2d} =	.079		
Chi-square[c] =	326.900***		
N =	4159		

a: Coefficients for categorical variables indicate group differences from the sample mean and are standardized so their weighted sum equals zero.

b: Predicted likelihood of employment is conditional on other explanatory variables being constrained to their mean values. For a continuous variable, the predicted probability is evaluated at ± 1 standard deviation from its mean. The predicted probability .889 when all explanatory variables are set equal to their respective mean values.

c: Chi-square statistic is with respect to the null hypotheses that the predicted probability is equal across all groups of a categorical variable.

d: R^2 is not maximized in the MLE logit model. The calculated R^2 is equal to the percentage difference between the geometric means calculated respectively from the predicted probabilities and the observed sample frequencies, taken with respect to one minus the geometric mean of the sample frequencies.

*: 10% level of significance, two-tailed test.

**: 5% level of significance, two-tailed test.

***: 1% level of significance, two -tailed test.

TABLE 16

LOGIT COEFFICIENTS ON THE PROBABILITY OF EMPLOYMENT: OCTOBER 1976

(absolute value of asymptotic t ratios in parentheses)

Variable	Logit Coefficient[a]		Predicted Probability[b]	Chi-square[c]
Zip Code E/POP Ratio	.458	(0.34)	.885, .889	
Zip Code Community Income ($1000's)	.008	(0.28)	.885, .889	
Community Type - 1976				2.62*
Rural	.039	(0.35)	.891	
Small City	.036	(0.41)	.890	
Medium City	-.013	(0.13)	.886	
Large City	.062	(0.68)	.893	
Very Large City	-.165	(1.52)	.869	
Parents SES	.006	(0.53)	.885, .889	
Race/Sex				10.96***
Nonwhite Male	-.005	(0.03)	.887	
Nonwhite Female	-.355	(3.0)***	.846	
White Male	.139	(2.3)**	.900	
White Female	-.040	(0.57)	.883	
High School Program				.20
General/Academic	-.014	(0.45)	.885	
Voc. Ed.	.034	(0.45)	.890	
Average Aptitude Score	.017	(2.08)**	.874, .899	
High School Grade Avg.	.014	(1.71)*	.877, .896	
High School Leader				6.74***
Yes	.233	(2.60)***	.908	
No	-.078	(2.60)***	.879	
Earned PSE Certificate				4.70**
Yes	.255	(2.17)**	.910	
No	-.049	(2.17)**	.882	
Earned PSE License				.39
Yes	.128	(0.63)	.899	
No	-.009	(0.63)	.886	

(Continued)

TABLE 16 (Continued)

Variable	Logit Coefficient[a]		Predicted Probability[b]	Chi-square[c]
Earned PSE Voc. Ed. Degree				8.24***
Yes	.686	(2.87)***	.940	
No	-.042	(2.87)***	.882	
Earned PSE Junior College Degree				2.89*
Yes	.354	(1.70)*	.918	
No	-.023	(1.70)*	.885	
Earned PSE Other Degree				.02
Yes	.043	(0.15)	.891	
No	-.001	(0.15)	.887	
Employment/1974-76 Migration Status				211.04***
Employed, job related move	.424	(1.36)	.923	
Employed, transfer	-.602	(1.26)	.811	
Employed, other reason	-.240	(7.58)***	.693	
Not employed, job related move	.061	(0.15)	.893	
Not employed, other reason	-1.430	(6.30)***	.651	
Employed, no move	.382	(11.63)***	.920	
Not Employed, no move	-.944	(10.94)***	.753	
Moves				1.26
None	-.001	(0.02)	.887	
1 Move	.059	(0.50)	.893	
2 Moves-return	-.091	(0.33)	.877	
2 Moves-repeat	-.236	(0.93)	.861	
Military				6.81
In Military	-.671	(2.61)***	.800	
Not in military	.019	(2.61)***	.889	

(Continued)

TABLE 16 (Continued)

Variable	Logit Coefficient[a]	Predicted Probability[b]	Chi-square[c]
Constant Term	-.156	(0.18)	
R^{2d} =	.080		
Chi-square[c] =	326.650***		
N =	4159		

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a: Coefficients for categorical variables indicate group differences from the sample mean and are standardized so their weighted sum equals zero.

b: Predicted likelihood of employment is conditional on other explanatory variables being constrained to their mean values. For a continuous variable, the predicted probability is evaluated at ± 1 standard deviation from its mean. The predicted probability is .887 when all explanatory variables are set equal to their respective mean values.

c: Chi-square statistic is with respect to the null hypothesis that the predicted probability is equal across all groups of a categorical variable.

d: R^2 is not maximized in the MLE logit model. The calculated R^2 is equal to the percentage difference between the geometric means calculated respectively from the predicted probabilities and the observed sample frequencies, taken with respect to one minus the geometric mean of the sample frequencies.

*: 10% level of significance, two-tailed test.

**: 5% level of significance, two-tailed test.

***: 1% level of significance, two-tailed test.

E. WAGE IMPACT OF MIGRATION

1. General Discussion and Empirical Specification

This section examines the implications of migration for the percentage change in hourly wage rates that occurred between October 1974 and October 1976. The sample consists of single persons who were employed at both the beginning and end of the two-year analysis period. Following a general discussion, the dependent variable and estimating technique are described, and the empirical results interpreted.

The two-year wage change equation stems directly from the extensive economics literature on estimating rates of return to investments in human capital. The first step in the specification is to derive a percentage wage change equation. The second step amends the difference equation to control for violations in *ceteris paribus* conditions during the interim period; specifically, (1) the acquisition of human capital through on-the-job training and increments to schooling, and (2) investments in the form of migration and job change.

The motivation for the change equation is shown for the two-year analysis period. Two log-wage equations are specified as functions of weeks of labor force experience (EXP), experience-squared (EXP^2), fixed educational attainment (ED), health status (HS), local unemployment rate (U), socioeconomic background (SES), and a stochastic term (e). The quadratic EXP term is intended to capture the curvilinear experience-wage relationship. Implicit is the assumption that the marginal effects of explanatory variables on wage rates are independent of time. For periods t and t+2 (t = 1974), suppressing individual subscripts, we have:

$$\ln(W_t) = a_t + a_1 EXP_t + a_2 EXP_t^2 + {}_3 ED_t + a_4 HS_t + a_5 U_t + a_6 SES + e_t \qquad (1)$$

$$\ln(W_{t+2}) = a_{t+2} + a_1\ (EXP_t+2) + a_2(EXP_t+2)^2 + a_3ED_t + a_4(HS_t + \Delta HS) \quad (2)$$

$$+ a_5(U_t + \ \Delta U) + a\ _bSES_t + e_{t+2}$$

Taking the difference between (2) and (1) yields:

$$\ln\left(W_{t+2}/W_t\right) = b_0 + b_1\ EXP_t + b_2\,\Delta\,HS_{t+2} + \ b_3\ \Delta U_{t+2} + \ e^* \qquad (3)$$

where $b_0 = (a_{t+2} - a_t) + 2a_1 + 4a_2;\ \ b_1 = 4a_2;\ b_2 = a_4;\ \ b_3 = a_5;$

$$e^* = (e_{t+2} - e_t) \sim N(0,\ \sigma_t^2 + \sigma_{t+2}^2 - 2COV(e_t e_{t+2})).$$

Hence, the percentage wage change over the two year period in equation (3) is a function of initial labor force experience, changes in local unemployment rates and health status, and a stochastic element.

The second step in the specification is to control for wage growth that may have occurred during the intervening period that is not reflected in the cross-section equations. At an individual level, three forms of human capital investment may influence observed growth rates. First, additional on-the-job training (OJT) is expected to enhance productive skills, thereby increasing observed wage rates. Lazear (1976) posits that unobserved increments to OJT can be approximated by a linear function of age, additional work experience, initial years of schooling (ED), and initial work experience, and finds that each is a significant determinant of wage growth. We control for incremental OJT in this analysis by including a measure of aptitude (IQ) along with EXP in the estimating equation. Age and initial years of schooling are not included because they are essentially constant for our cohort of high school graduates.

Second, additional schooling (voc-ed, junior college, and other PSE training programs) may have been acquired which may enrich productivity and consequently lead to greater wage growth. We control for additional education (ED) by including a series of dummy variables denoting the earning of a degree sometime between high school graduation and October 1976. Third, a worker may invest resources in migration (M), job change (JOB), and job search activity (S). Separate measures for M are used to examine the impact of migration that occured between high school and October 1974, as well as between October 1974 and October 1976. Except for job transfers, migration implies a job change, whereas the reverse is not necessarily true. S is measured only at the time of October 1974 and because of the data, we restrict the variable to a dichotomous measure of whether or not search occurred.

Incorporating the above factors influencing wage growth into equation (3) results in the final specification for the percentage change in wage rates for the two year period. This specification also allows for the possibility of differential wage change by race/sex (R/S) because of potential market discrimination and/or different R/S career paths.

$$\ln\left(W_{t+2} / W_t\right) = b_0 + b_1\,EXP_t + b_2\,\Delta HS_{t+2} + b_3\,\Delta U_{t+2} + b_4\,IQ + \qquad (4)$$

$$b_5\,\Delta ED_{t+2} + b_6\,M_{t+2} + b_7\,\Delta JOB_{t+2} + b_8\,S_t + b_9\,R/S + e^{**}$$

Note that changes accompanying migration and interfirm mobility, such as changes in origin-destination characteristics (e.g., city size), movement across occupation industry, and union lines are omitted from the specification. If the labor market, as defined by the characteristics were held constant, then only intra-market returns to M, ΔJOB, and S would be estimated. This would yield misleading estimates of the productivity of job/location mobility because a worker's current type of origin-destination, occupation, industry, and union status are inaccurate indicators of the markets in which a worker is able to participate.

In the discussion that follows, several modifications are made to equation (4). In general, the interpretation of the results is discussed along the lines developed above:

- Role of personal characteristics
- Return to postsecondary education
- Role of labor force experience, job change, and job search
- Impact of migration

2. Dependent Variable and Estimation Technique

The sample necessarily excludes persons without jobs in October 1974 and October 1976 in order to construct an observed, percentage change in wage rates over the two-year time period. Recall that full-time students and military personnel are also excluded from the sample. The hourly wage rate is constructed as gross earnings reported by a respondent for an "average" week, divided by the average hours of work for such an average week. Both variables refer to the job at which a respondent was working during the first week in October (1974 or 1976).

In equation (4), the natural logarithm of the ratio of the two wage rates is equal to the percentage change in wage rates. We use ordinary-least-squares regression applied to equation (4). In practice, however, we regress ln(W-76) against the right-hand-side variables, including ln(W-74). While the specification preserves the change specification, it also permits the coefficient on ln(W-74) to vary, rather than be constrained to unity as in equation (4).

3. Sample Selectivity

As mentioned in section C, the wage change analysis is subject to two sources of sample selectivity. The first is due to the observed migration selectivity, which, if related to wage growth, may bias the estimated coefficients in the wage change equations. We test for this likelihood by including predicted as well as actual migration variables in the change equation. However, the coefficient on the former is insignificant ($t=.02$), suggesting that observed migration is uncorrelated with the error term.

A second type of sample selectivity arises from the exclusion of persons who were not employed, full-time students, or in the military in either October 1974 or October 1976. Because migration and employment status are related to one another, we must control for the sample selection rule in order to estimate a consistent and unbiased measure of the direct effect of migration on wage change. In the regression results presented in table 17, lambda measures the individual variation in the disturbance term that is conditioned on being included in the sample. The significant and positive estimated coefficient on lambda indicates that there is a selectivity phenomenon taking place.

4. Interpretation of Empirical Results

As discussed earlier, the wage change equation is actually estimated by regressing the natural log of the October 1976 wage rate, log(W-76) against a set of independent variables, including log(W-74). This respecification retains the change model while permitting the log(W-74) coefficient to vary from unity. The fact that the its estimated coefficient equals .49 suggests a general compression in the distribution of wage rates: persons with relatively high initial wage rates tend to experience smaller percentage changes in wage rates than similar persons with lower initial wages. This "regression to the mean" phenenomenon may also be capturing transitory elements and/or measurement errors that tend to offset one another over time.

The change specification noted in equation (4) calls for an explanatory variable measuring changes in local labor market conditions. However, the only available data are from the 1970 Census which, of course, do not permit the construction of a change variable.

There are several personal characteristics which are estimated to affect significantly the two-year percentage change in wage rates. Referring to the equation (A) results in table 17, there does not appear to be any racial differences with respect to wage change. Females, however, experience significantly smaller wage gains that are 8 and 12 percent lower than for white males (the excluded group). Possible explanations for this disparity in wage growth might be (1) sex discrimination by employers; (2) occupations and industries in which females predominate are characterized by relatively low wage growth; and (3) females may have less labor force experience and/or greater job instability beyond that for which is accounted for in the equation which leads to lower wage gains.

An individual's aptitude is expected to influence the rate of which job skills are acquired and enhanced while on-the-job. This general measure of ability, measured during the spring of the senior year in high school, is estimated to have a significant and positive impact on wage change over time. The average score measured over six aptitude tests for the sample was about 49 with a standard deviation of about 7. Comparing two persons at ±1 standard deviation from the mean value, in light of our results, would lead to the prediction that the one with the higher aptitude score would experience a 7 percent higher gain in wage rates over the two-year period than an otherwise similar individual with the lower measured score. Given that the average two year wage change was 22.7 percent for the sample, the role of aptitude is considerable. To the extent that the quality of education, as opposed to quantity, affects measured aptitude, the implied wage repercussions of the schooling system are quite significant.

The estimation found that a young person's socioeconomic background did not have a influence on wage growth. Nor did the course study while in high school (general or academic versus a vocational education program) have a significant impact.

Postsecondary education is expected to be associated with higher wage rates because additional schooling presumably adds to a person's stock of human capital. To the extent that such increments are of marketable value (i.e., affect a worker's productivity), workers who acquire such training should command a higher wage rate than in its absence. The variables used to measure postsecondary education (PSE), however, are crude and the results should be interpreted with caution. First, a distinction should be made between PSE degrees earned before and during the analysis period. If PSE has a positive, but once-only effect on wage rates, then a wage change specification such as ours may underestimate the return to PSE if most of the observed training occurred before October 1974, and vice versa for a degree earned during the analysis period. Second, attendance, length of stay, and type of program may influence the return to PSE programs. Third, there may be systematic, but unobserved differences between those who enroll and earn PSE degrees and those who do not. Without controlling for this sample selectivity, estimates of the pecuniary effects must be considered tentative at best.

Our purpose in including PSE degrees, however, is not to analyze the returns to post-high school education. Rather, it is to control for the possible influence of this form of human investment in order to obtain unbiased estimates of the impact of migration on wage rates. With the foregoing caveats in mind, the results do indicate a positive effect of PSE on wage change that is significant for earning a PSE license. In some unreported regressions, it was found that males earning a certificate experienced an 8 percent higher increase in wage rates than comparable males who did not earn any PSE degree or certificate. Females, on the other hand, who earned a license or junior college degree experienced 7 or 8 percent higher increases in wage rates than those who did not acquire any PSE degree. If these results withstand further empirical scrutiny, than policy-makers will have available some important evidence in making decisions concerning the expansion, targeting, or demise of vocational and junior college postsecondary education.

An individual's recent labor force experience may affect the wage growth rates insofar as on-the-job experience is associated with increments to work skills. While this influence undoubtedly depends on the type of job, we attempt to control for this effect in a general manner by using the number of weeks employed during the 12 months prior to the analysis period and by the weeks employed during the two-year period. The regression results imply that labor force experience, ceteris paribus, does contribute to wage growth. The greater size and significance of the coefficient for October 1973 to October 1974 weeks employed relative to that for the October 1974 to October 1976 experience variable suggests a lagged effect of one to two years.

While our measures of recent and current work experience do not capture the total experience accumulated by a young person, its influence on wage growth is consistent with existing labor supply analyses that have found a quadratic relationship between wage rates (or earnings) and total labor force experience. The findings presented here are thus in agreement with existing empirical evidence generally pertaining to a cross-section of all American workers and indicates that the wage payoff to additional labor force experience also occurs for the younger members of the work force who have graduated from high school. In sum, young workers benefit from continued employment in the form of higher wage rates.

The economic job search and migration literature predicts that voluntary job change and migration for job related reasons should be associated with higher wage rates because workers presumably leave their current job-location positions when better opportunities are believed to lie elsewhere. Given the absence of perfect information and inefficient job location search activity, this general prediction may not hold. For example, Black (1980) finds that the wage impact of quitting among adult males is significantly governed by prevailing job opportunities, prior search activity, and existing wage opportunities specific to a worker's skills and current wage.

One problem with the NCES data is that we cannot distinguish between voluntary and involuntary job terminations during the 1974-76 period. Rather, the analysis is limited to job instability which is measured by the year in which a worker began his or her October 1976 job. Three job start intervals are examined: before 1975, during 1975, or during 1976.

In addition, the analysis combines job change with location change in order to estimate their separate effects. Migration is measured over two intervals: the first covers the period from high school graduation to October 1974, and the second is defined by October 1974 to October 1976. Furthermore, because the primary interest is in job related moves, the analysis excludes persons reporting a move for other reasons (personal, environmental, and job transfers--only have a handful of the latter are reported).

The results for equation (A) in the following table offer a number of interesting insights with regard to job-location changes. First, workers who switch jobs locally (i.e., do not migrate or move less than 100 miles from their 1974 location) during the analysis period, are estimated to experience smaller percentage wage changes than comparable workers who neither moved nor switched jobs during the 1974-76 period (the omitted category in the equation). The relative loss is especially apparent for the most recent job changes who are estimated to experience a two-year wage change that is 8 percent less than similar, but immobile workers.

Secondly for those who changed employers during 1975, but stuck with their jobs thereafter, the estimated coefficient is considerably smaller (-.03) and insignificant. This finding may imply that job instability has an immediate and detrimental effect on wage rates, but the relative wage reduction does not persist over time. While the results are quite interesting in that they indicate unstable workers tend to suffer wage losses in the marketplace, they must remaind tentative until additional time series data permit examination of longer time periods following a job change.

Third, the negative wage repercussions of recent job mobility, however, do not hold for workers who migrate (and change jobs). That is, migration appears to be an effective way to increase one's wage rate vis-a-vis similar workers also either change jobs locally or remain immobile. In general, we find that migration yields a positive pecuniary return (costs, unfortunately are unknown). Young workers who moved during the 1972-76 period experience, on average, a two-year wage change that is about 7 percent higher than workers who remained at their jobs throughout the analysis period. Although the coefficient on 1974-76 migration, coupled with a 1975 job start, is similar to the other migration-job change coefficients, it is insignificant; probably due to the few sample observations for that combination of activities. Fourth, the positive return to 1972-74 movers who subsequently do not switch jobs is interesting in that it suggests that migration may serve as a way for workers to locate jobs with longer term wage growth potential. However, this observation must be tempered by the short-run nature of this analysis.

In sum, the wage impacts of migration make sense in the context of our theoretical model. As formulated in Chapter IV, workers are assumed to set a higher wage acceptance standard in selecting jobs in more distant labor markets than those contemplating a local job change. This is because the former must recoup the added costs of relocating to a new area and possibly to offset the greater amount of ignorance or uncertainty associated with a more distant job hunt. The results are consistent with this view of behavior and they also imply that workers are able to take advantage of a wider choice set of job offers, leading to relatively greater increases in wage rates.

In terms of dollar magnitudes, the estimated gross returns to migration are sizeable. Contrasting migrants with workers who neither change jobs nor locations, the estimated 7 percent difference in wage change translates into a gain of $.22 per hour. Using the sample mean of 46 weeks of employment and 37.5 hours worked per week, the predicted impact of migration translates into an annual return of $372. Among the subset of job changers, the estimated annual earnings differential between migrants and nonmigrants is $797. In addition, the results for 1972-74 migrants suggests that this monetary differential may subsequently increase over time, further increasing the returns to geographic mobility.

In equation (B), the analysis shifts to examine what types of geographic moves are associated with the most (least) favorable changes in wage rates. In this case, migration is decomposed into broad origin-destination characteristics, where a rural (R) location is defined as a rural area or small city/town of fewer than 50,000 persons (and not a suburb of a larger community); and urban (U) includes all other larger city and related suburban areas. While this exercise is constrained by the small number of movers, it does provide some information about the direction of movement and the corresponding wage implications. Our a priori expectation is that larger cities are characterized by larger, denser labor markets which offer a wider opportunity for job matches and for finding higher paying jobs than in rural areas. Offsetting the higher wage levels in larger cities is the higher cost of living that is not measured by the data.

Focusing on the origin-destination dummy variables, note that the excluded categories for both 1972-74 and 1974-76 migration are the subset of persons living in a rural community and who did not move at all during the respective time period. In both periods, young workers moving to the city from a rural area experienced the greatest wage growth (about 20 percent higher) compared to their rural counterparts who did not move. The rural-urban migration appears to be a financially attractive undertaking. Movement in the opposite direction does not appear to have a significant impact.

Surprisingly, rural-rural movers significantly improved their relative wage position, especially during the 1974-76 period. Also during the second period, urban-urban migrants experienced significantly greater wage gains than the control group of immobile, rural residents. The estimated coefficients for origin-distinction moves, however, do not include the generally negative impact of job change; the latter having an average negative impact estimate at 8 percent, which should be deducted from the above migration gains since a job change is implied by geographic mobility.

In an unreported regression analysis, the sample was enlarged to include persons who moved for nonjob related reasons. Almost as many persons moved during 1974-76 for nonjob related reasons, including job transfers as for only job reasons (86 versus 94). However, the estimated change in wage rates for the former subgroup is both small in size and significance (.003, t ratio of .08), indicating a negligible influence. This finding is expected and we do not focus on this subset because our theoretical and empirical analyses are oriented toward persons who base their migration decisions on the perceived wage repercussions of mobility.

Finally, a number of regression experiments were conducted to ascertain whether or not the estimated returns to job-related migration was influenced one or more personal attributes. Both sex and race were interacted with the 1972-74 and 1974-76 migration variables. And, the ensuing results indicate that, _ceteris paribus_, the implications of migration do not depend significantly on the racial or sexual identity of the mover. Nor does the impact of migration and/or job change appear to be influenced by an individual's aptitude. However, interacting SES with the various job change/location change variables did uncover one interesting relationship: Individuals from lower SES family backgrounds are estimated to achieve significantly greater wage returns than migrants from higher SES backgrounds. While not conclusive, the results suggest that geographic mobility, _ceteris paribus_, may serve as a viable means for relatively disadvantaged youth to enhance their financial well-being.

In another unreported effort, equation (A) was respecified to include (1) the occurrence of job search reported as of October 1974, (2) the respondent's willingness to relocate for a job, and (3) a combination of the two. Also, the search-willingness to move variables were interacted with the job-location change variables to see if prior search influenced the outcomes of job and/or location changes. The results, however, indicate that prior "search-willingness to move" does not have a significant impact on wage change, either alone or in conjunction with the mobility variables. The lack of effect may be explained as much by the small numbers of observations involved and the roughness of the empirical measures, as it is by the potential lack of any systematic relationship.

TABLE 17

REGRESSION COEFFICIENTS ON THE OCTOBER 1974 TO OCTOBER 1976 PERCENTAGE CHANGE IN WAGE RATES

(absolute value of t ratios in parentheses)

Variable	Equation A	Equation B
Log (W-74)	.493 (23.31)***	.488(23.01)***
Nonwhite Male (196)[a]	.005 (0.20)	.005 (0.19)
Nonwhite Female (168)	-.075 (2.57)***	-.074 (2.69)***
White Female (649)	-.119 (6.75)***	-.122 (7.01)***
General/Academic Program (1155)	.000 (0.014)	.008 (0.57)
Socioeconomic Status of Parents	.006 (0.48)	.009 (0.67)
Aptitude Score	.005 (3.96)***	.004 (3.62)***
Earned Certificate (284)	.023 (1.14)	
Earned License (116)	.068 (2.34)***	
Earned Voced Degree (71)	-.001 (0.01)	.004 (0.12)
Earned Jr. College Degree (65)	.021 (0.55)	.021 (0.55)
Earned other Cert/Degree (49)	.074 (1.67)*	.071 (1.62)
No. Weeks Employed: 10/73-10/74	.002 (2.79)***	.002 (2.72)***
No. Weeks Employed: 10.74-10.76	.001 (1.56)	.001 (1.15)
10/76 Job Started in 1975 (276)	-.026 (1.19)	-.034 (1.61)
10/76 Job Started in 1976 (492)	-.082 (4.34)***	-.083 (4.53)***
1972-74 Migration, Job Start < 1975 (76)	.064 (1.76)*	
1972-74 Migration, Job Start in 1975 (18)	.070 (0.97)	
1974-76 Migration, Job Start in 1976 (63)	.067 (1.67)*	
Lamada	.082 (1.97)**	
No 1972-74 Move, Urban Resident (789)		.020 (1.06)
R R 1972-74 Move (50)		.081 (1.84)*
R U 1972-74 Move (50)		.172 (3.72)***
U R 1972-74 Move (18)		.034 (0.47)
U U 1972-74 Move (60)		.026 (0.60)
No 1974-76 Move, Urban Resident (915)		.031 (1.59)
R R 1974-76 Move (22)		.180 (2.76)***
R U 1974-76 Move (25)		.196 (3.19)***
U R 1974-76 Move (18)		-.048 (0.67)
U U 1974-76 Move (29)		.171 (2.93)***

(Continued)

TABLE 17 (Continued)

Variable	Equation A	Equation B
Constant Term	.435	.503
R^2	.352	.361
F Statistic for the Equation	47.59***	37.88***
N	1773	1773

a: dummy variables are followed by the number of observations in parentheses.

*: 10% level of significance, two-tailed test.

**: 5% level of significance, two-tailed test.

***: 1% percent level of significance, two-tailed test.

F. SUMMARY OF THE EMPIRICAL RESULTS

Potential migrants are presumed to weigh the expected increase in earnings from moving by the chance of obtaining such an increase, less the costs of searching and relocating. To the extent that individuals behave according to this model, we expect to observe positive labor market outcomes for those undertaking such an investment. The empirical analysis has provided a number of useful insights into the employment and wage effects of migration that offer strong corroboration of the theoretical implications. In addition, the estimation found that the impacts of migration were influenced to some extent, by a mover's personal characteristics and initial labor force status.

The empirical analysis was split into two parts which examined the effects of migration on (1) the probability of being employed in October 1976, and (2) the percentage change in wage rates between October 1974 and October 1976. As will become evident, the two empirical approaches offer complementing insights into youth migration which would be missed if only one analysis tack were pursued. In what follows, the employment effects are summarized first, followed by a synopsis of the wage effects, and concluding with a summary of the most interesting findings with regard to the other explanatory variables used in the estimation.

First, there is a substantial difference between persons whose migration decisions are linked to labor market activity and those who move for nonjob reasons (personal, school, environment). On average, the latter are significantly less likely to be employed in October 1976 than job-related movers and immobile workers. Furthermore, the lower incidence of employment among nonjob-related movers is not influenced by personal characteristics or by initial labor force status. This finding is not surprising in light of the conceptual model that was built on the hypothesis that potential movers base their decisions on a calculus of maximizing earnings. Clearly, the objective function to be maximized must be altered or expanded if we are to predict and measure the repercussions of migration that is motivated by other, non-labor market objectives.

Second, the employment outcome of job-related moves is dependent on initial (October 1974) labor foce status. Among those who were initially employed, migration is estimated to result in a slight, insignificant increase in the probability of employment in October 1976 over that of similar nonmovers. Among those who were without jobs in October 1974, migration has a large, positive effect on subsequent employment. These findings suggest that jobless workers are able to raise their chances of employment through migration to almost the same level as for the initially employed. This is a significant result because our analysis finds that a worker's employment status tends to persist over time. Hence, migration may play a key role in enabling young workers to escape from areas where they are without work.

Third, a closer look at the positive impact of migration for those who were initially without jobs revealed a sharp difference between students and nonstudents. Students who were not working were estimated to have a much higher employment probability if they migrated than if they did not. On the other hand, migrants who were neither employed nor enrolled in school increased their chances of employment over similar nonmigrants by an insignificant margin.

Fourth, the above indicates that migration enhances the prospects of employment for persons initially without jobs, especially students.

Migration, however, does not appear to increase the likelihood of employment for workers originally employed, the subset with the highest employment incidence. In the wage change analysis, the focus shifts precisely to this subgroup of initially employed workers to examine whether or not migration influences the rate of wage growth during the two-year analysis period. In general, the results indicate that migration has a significant and positive effect on wage change for workers employed at both the beginning and end of the time period. Thus, geographic mobility appears to have a positive economic effect for migrants, although the way it improves an individual's financial position varies by his or her recent employment experience.

Fifth, the wage returns to migration (excluding costs) is estimated to hold only for persons who move for job-related reasons. Moves undertaken for non-labor market purposes have an insignificant effect on wages, although the employment analysis suggested that this group of movers were much less likely to have found jobs by October 1976.

Sixth, migration (excluding job transfers) implies a job change. Contrasting the wage experience of job switchers who did and did not migrate resulted in a significant wage differential in favor of job and location changers than similar, but local job changers. This evidence is consistent with the hypothesis that workers set higher acceptance standards in selecting jobs in more distant markets with greater associated uncertainty and relocation costs. The results also suggest that workers benefit financially from expanding the geographic scope of their job hunt because of the wider range of possible job offers.

Seventh, the pecuniary return to migration is greatest for rural-to-urban movers and smallest for urban-to-rural migrants. For moves undertaken during the 1974-76 period, rural-rural and urban-urban combinations of origin and destination also resulted in positive wage changes.

Eighth, it was found that the wage impact of job-related migration was related to a mover's socioeconomic background. The lower the family SES, the greater the wage benefits to migration. This interdependence presents an interesting, often overlooked, way in which persons from relatively disadvantaged backgrounds can enhance their financial status.

Ninth, an individual's aptitude is estimated to have a significant influence in increasing both the probability of employment as well as the percentage change in wage rates. The skills that are either innate and/or learned in high school are presumed to be important determinants of a worker's productivity, the rate at which new skills are acquired, and a person's ability to seek out new jobs in new locations. An individual's high school grades and evidence of leadership ability also play a positive role in the employment process, although they were found to be insignificant determinants of wage change. The influence of these high school-related variables on young workers' labor market successes, two to four years after graduation, suggest that the secondary education experience has important economic effects that remain with students as they enter into and participate in the labor market.

Finally, there is preliminary evidence that the acquisition of postsecondary education, in the form of earning non-four-year degrees or certificates, has a positive impact on both the incidence of employment and the rate of wage change. While there is theoretical justification for such a positive influence because of the increments to human capital, the private returns to public PSE programs has not been investigated in a systematic fashion. Our results suggests that a significant link may exist between postsecondary education and subsequent market outcomes.

CHAPTER VII

JOB SEARCH METHODS USED BY YOUTH

A. INTRODUCTION

This chapter examines job search methods used by recent high school graduates to find employment. Within the confines of the data, two important aspects of job search methods are investigated. First, tabular statistics are used to ascertain the extent to which members of the sample (1) use each of eleven possible methods (use rates), and (2) use and obtain jobs with each method (effectiveness rates). Second, the percentage change in wage rates between October 1974 and October 1976 is examined to estimate the gross wage effects of search methods used by persons to obtain their October 1976 job. The regression analysis is applied to two samples of workers who were employed at both the beginning and end of the two year period, and who either remained at the same job or successfully switched jobs. In what follows, the sample use and effectiveness rates are discussed in section B, the wage impact analysis is presented in section C, and some summary remarks are made in section D.

The process of looking for a job has a number of important features that have been discussed in chapter III. Essential elements of search include the methods used to acquire job information and offers, the time spent looking (hours per week, number of weeks), purchased inputs (private agencies, advertisements, travel), and the pecuniary and nonpecuniary job acceptance standards set by the searcher. While a comprehensive examination of job search should incorporate all of these features, existing research has focused on just one or two aspects. In this sense, our analysis is no exception - the search process is too complex to investigate in its entirety with current data sets. Nevertheless, search methods constitute an important topic because the methods selected may direct job seekers towards particular kinds of jobs (or put differently, some jobs and labor market successes may be accesible only through certain employment channels).

B. USE AND EFFECTIVENESS OF SEARCH METHODS

1. General Discussion

This analysis is designed to identify patterns of usage and effectiveness. If a method is associated with a high (low) effectiveness rate, then there may be some justification for government to encourage (discourage) its selection. An important caveat to such a conclusion is that our sample statistics do not control for interpersonal variation that may influence the outcome of a given method. A second important qualification is that all search methods do not have the same costs, either private or social, so that an "ineffective" method may be used frequently if it is relatively cheap.

The search literature frequently makes a distinction between formal and informal methods of job search. Formal methods are defined as those which involve an institutional intermediary to arrange a contact between employer and job applicant. Such methods include state public employment services, private employment agencies, school and college placement offices, union hiring halls, and community action groups. Informal methods include direct contacts to firms, and use of friends and relatives. Advertisement through the media (primarily newspapers, but also television and radio), while functionally formal inasmuch as the media serves as an intermediary between jobseekers and employers, is sometimes classified as informal because of low cost, casual use, and absence of an arranged employer-searcher interview.

Formal methods, generally offer more extensive job market information by uncovering a broader range of job possibilities across different employment sectors. Informal methods, on the other hand, often yield greater intensive job information (working conditions, advancement possibilities, fringe benefits) about relatively fewer jobs. As Rees and Schultz (1970) have pointed out, markets tend to be formally structured when the commodities being purchased or sold are highly standardized, and all that is essentially at issue is the exact selling or buying price, which is determined through extensive search. Should the items or services being exchanged vary substantially in kind, then greater intensive search will be required. Thus, it may be hypothesized that informal search methods, given their low cost and tendency to yield more in-depth information to both the prospective employer and employee, will be utilized most often when the variety of jobs and/or workers is great. Where the potential work force as well as the scope of job possibilities is relatively homogeneous, formal search methods should come to play a larger role in the employment process.

The NCES data provide a good opportunity to examine search methods used by recent high school graduates. As a useful counterpoint, the results described for the NCES sample are contrasted with similar results obtained by the Bureau of Labor Statistics (BLS) which are based on data from the Current Population Survey (CPS) conducted by the Bureau of the Census for BLS.

The source of youth search method information is the second follow-up survey (October 1974). While similar information is available from the first follow-up survey, there is little difference in the sample statistics and we focus on the later interview because the individuals have accumulated another year of experience in their brief exposure to the labor market. Before discussing the findings, several comments should be made with regard to the search data. First, the survey questionnaire queried respondents about whether or not they had engaged in any job search between October 1973 and October 1974. If affirmative, respondents were asked (1) to check one or more methods that were used and (2) to check one or more methods that led to a job. Note that multiple responses are possible and that indications of use or effectiveness do not convey any information about intensity, frequency of use, combinations of methods, duration, or acceptance standards.

Second, the retrospective questionnaire does not distinguish among separate periods of (un)successful job search. Hence, there is no way to link the use of search methods to particular outcomes since multiple episodes may have occurred. We could, in fact, do this by limiting the sample to single job changers but that would considerably narrow our focus. Third, the sample use and effectiveness rates gloss over a number of other aspects of search as well as personal heterogeneity that are likely to influence the outcome of search. Hence, the sample rate statistics are necessarily averages across all types of searchers.

2. Use and Effectivenss Rates

In the NCES sample, 7,254 persons indicated that they had looked for one or more jobs during the October 1973-October 1974 period and had reported using at least one search method. Statistics have been generated not only for the total group of searchers, but also for four race-sex subgroups (white/nonwhite, male/female). The questionnaire listed eleven search methods with a residual twelfth category ("other") to absorb responses that did not correspond to any of the defined methods. Use rates are calculated by dividing the number of persons using a method by the total number of searchers.

Effectiveness rates are constructed by dividing the number of persons who obtain a job using a given method by the total number of users of that method. The value of these statistics is that we can identify whether or not the use of certain methods appears to be justified given its associated effectiveness rate. Of course, a closer examination of what factors influence both the use and outcome of search methods, including their respective costs, should be undertaken prior to making policy recommendations from these results. Still, the following statistics tell an interesting and useful story.

In table 18, it is apparent that informal search methods are used far more frequently than formal methods. In particular, direct application to employers is the most commonly used method (74 percent of the sample), followed by the use of friends and relatives (57 percent) and use of media (53 percent). The most frequently used formal methods were public employment services (30 percent), followed by school and college placement (19 percent), and private employment agencies (15 percent).

The pattern of effectiveness rates for the total sample exhibits both similarities and differences to the use of search methods. Among informal methods, direct employer application (61 percent) and friends and relatives (59 percent) resulted in the highest job-finding rates, while media (27 percent) accounted for considerably fewer matches. Among formal methods, school and college placement (42 percent) and union registration (43 pecent) had the highest effectiveness rates, while the use of private employment agencies (29 percent) and public employment services (21 percent) appeared, on average, to be less successful routes to employment.

In addition, there are several race-sex differences suggested by the statistics in table 18. First, all four subgroups are more likely to use and find jobs with informal search methods than with formal methods. However, whites are considerably more likely to find jobs through formal methods, with the exception of media, than are nonwhites, even though the use rates are similar. Second, blacks are more likely, on average, to use formal methods than whites, and, by and large, these methods appear to be as effective for nonwhites as they are for white persons. For all subgroups, school and college placement services are an important formal employment channel.

In summary, the results indicate that whites are generally more successful in obtaining employment than are nonwhites, although the differential is most pronounced for informal methods and negligible for formal methods. This suggests that to the extent that racial job discrimination may occur in the marketplace, it is most apparent in screening persons via informal contacts. An equally likely explanation is that nonwhites may not have enough personal contacts or labor market information to use informal methods in an effective way. However, direct applications and friends/relatives are still the most promising avenues for nonwhites. Finally, care must be taken in interpreting subgroup

TABLE 18

JOB SEARCH USE AND EFFECTIVENESS RATES: OCTOBER 1973 - OCTOBER 1974

Search Method	Use Rate					Effectiveness Rate				
	Total	NW Male	W Male	NW Female	W Female	Total	NW Male	W Male	NW Female	W Female
Direct Employer Contract	74.0	68.8	76.7	65.8	75.7	45.3	38.4	50.0	31.0	48.2
Friends and Relative	57.3	62.4	61.1	53.4	53.7	33.8	32.1	40.7	22.0	32.3
Media (newspaper, radio)	53.3	52.5	46.1	59.5	58.0	14.6	10.3	13.0	11.3	18.6
Public Employment Agency	14.8	16.3	10.1	24.5	15.2	4.3	5.1	2.7	5.4	5.2
School and College Placement	19.3	24.1	16.7	26.0	18.0	8.1	8.0	7.3	10.4	8.1
Civil Service Application	15.1	23.1	12.6	24.3	11.9	3.0	4.4	2.5	4.6	2.6
Professional Periodical	10.3	13.3	9.3	14.5	9.0	1.8	2.5	1.3	2.0	2.1
Union Registration	5.8	10.7	9.8	4.0	1.5	2.5	4.6	4.5	.4	.9
Community/Welfare Group	5.0	9.4	2.6	13.5	2.8	1.0	2.4	.5	2.2	.7
Job Fair	2.7	6.0	2.0	5.8	1.5	.8	2.6	.6	1.1	.5
Other	3.7	4.0	3.7	3.9	3.5	2.7	3.0	3.0	2.1	2.5

SOURCE: Mathematica Policy Research, Inc.

differences because the statistical significance across pair-wise differences have not been computed.

3. Jobseeking Methods Reported by BLS

As reported by Rosenfeld (1975), BLS financed a national survey in January 1973 of all persons aged 16 years and older. The method used most often (66 percent) was direct application to employers without suggestions or referrals by anyone. Direct application was also cited by the largest proportion (35 percent) as the method by which they found their present job. Next in rank were asking friends about where they work (12 percent), and answering newpaper ads (12 percent). With respect to effectiveness rates, direct applications (48 percent) was the clear standout, followed by several methods whose effectiveness rates ranged from 19 to 24 percent: friends, relatives, answering newspaper ads, private employment agencies, school placement, and union halls.

The BLS report also indicated that among active job searchers in January 1973, workers averaged four different methods in their job search; 20 percent used only one method, and 33 percent used five methods or more. There was little race-sex difference in the average number of methods used. About one-third of all jobseekers had turned down one or more offer, with nonwhites being less likely to refuse work (22 percent). Jobseekers generally spent relatively few hours a week looking for a job. About 66 percent reported looking for five hours a week or less, and about 20 percent looking for 11 hours or more per week. Jobseekers generally restricted the geographic range of their job hunt to relatively short distances from their homes. About 40 percent looked no farther than 10 miles,

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70 percent looked no farther than 25 miles, another 14 percent looked up to 50 miles, 8.5 percent searched in areas more than 100 miles from home.

Rosenfeld (1977), using May 1976 CPS data on jobseeking methods, reports little difference in methods used between employed and unemployed searchers, regardless of race or sex classification. One difference in search method usage between the two labor force categories was that unemployed persons (26 percent) were more likely to use a public employment agency than employed workers (19 percent). This probably reflects the work registration requirement imposed by the unemployment insurance system on active claimants.

According to Rosenfeld (1975), the biggest differences between young workers (especially teenagers, 16-19 years, of age), and prime-aged workers are that the former (1) use public and private placement agencies less often, and (2) go directly to employers more frequently. However, with regard to how the current job (January 1973) was obtained, the pattern between young workers (16-24 years old) and prime aged workers (25 to 44 years old) is quite similar. The notable exceptions are that young workers are relatively more likely to have found their job through a relative (11.5 versus 6.0 percent), school placement (4.6 versus 1.8 percent); and less likely to have found a job by answering a newspaper advertisement (9.8 versus 13.6 percent).

C. WAGE IMPACTS OF JOB SEARCH METHODS

1. General Discussion

The percentage wage change analysis discussed in this section is a direct extension of the wage impact analysis presented in Chapter VI. Here, the estimating equation builds on the previous specification by adding search methods to an otherwise identical list of predictor variables. The dependent variable is the percentage change in wage rates that occurred between October 1974 and October 1976.

The rationale for using a change equation was described in the preceding chapter. In brief, the justification is that a good approximation of the short-run effects of human capital investments (excluding costs), is to compare before and after wage rates for persons who do and do not undertake such an effort. Workers who enhance their human capital are expected to experience a positive return in the form of higher wage rates than would have transpired had such an investment not been made. Apart from general wage inflation, workers are presumed to reap positive returns from additional schooling, on-the-job experience/training, and job mobility. The latter includes search activity to acquire job information and job offers, as well as job and location changes. However, the wage rate may capture only part of the returns to human capital investments to the extent that there are nonpecuniary returns, and that investments may influence both the likelihood of employment and the number of work hours.

In Chapter VI, the wage repercussions of job and location mobility were examined. A notable finding was that recent job changers had relatively smaller wage gains, than job stayers, unless job mobility was accompanied by migration. This chapter takes a closer look at job changers to investigate the role of search methods in affecting wage outcomes. Toward this end, the same sample used in chapter VI (except for these cases eliminated because of missing search data) is split into two subsamples: (1) those who switched jobs during the two-year analysis period and (2) those who remained at the same job between October 1974 and October 1976. This focus is prompted by the relatively poor wage growth estimated for recent job changers. Because of this, it is useful to determine whether or not the payoff to search methods differs by the recency of a job change.

In what follows, descriptive statistics are presented for the two samples and the regression results are discussed.

2. Descriptive Statistics

The samples of 768 job changers and 971 job stayers are very similar with regard to personal, high school, and postsecondary education attainment. Because of the similarity with the previous chapter, these statistics are not reproduced here. However, the two samples do exhibit a number of differences with respect to wage rates, labor force experience, and search methods. To highlight these differences, the descriptive statistics are reported separately for workers who started their October 1976 job before 1975 and those who started sometime during 1975 and 1976 (i.e., recent job changers).

As seen in table 19, job stayers enjoyed an initial wage advantage over job changers, which increased from $.24 (7.5 percent) to $.72 (9.4 percent) over the two-year period. This increasing differential was reflected in the previous regression results for the entire sample after controlling for other sources of individual variation. In addition, job switchers appear to have worked fewer weeks during the year before the analysis period, a differential that increased from 4 weeks (8 percent) to 12.5 weeks (13 percent) during the two years between October 1974 and October 1976. This evidence suggests that job mobile workers suffered a relative decline in both work hours as well as hourly earnings. The fewer weeks worked during the analysis period may also imply that job changers, on average, experienced a spell of unemployment between jobs. An important weakness of the NCES data is that the reason for job termination is unavailable. Thus, we are unable to discern whether or not job losers fare relatively worse in the labor market than job leavers.

TABLE 19

SELECTED DESCRIPTIVE STATISTICS FOR JOB STAYERS AND JOB CHANGERS
(sample proportions or means with standard deviations in parentheses)

Variable	Statistic	
	Job Stayers	Job changers (1975-76)
October 1974 Wage Rate	$3.19 (1.47)	$2.95 (1.47)
October 1976 Wage Rate	$4.05 (1.47)	$3.67 (1.47)
No. Weeks Employed: 10/73 to 10/74	46.88 (13.10)	42.99 (14.02)
No. Weeks Employed: 10/74 to 10/76	98.46 (19.04)	85.94 (22.70)
October 1976 Job Started in 1975	-	.36
October 1976 Job Started in 1976	-	.64
Moved only during 1972-74	.08	.13
Moved between 10/74-10/76	-	.11
Search Methods Used to to Obtain October 1976 Job:		
School/College Placement	.09	.02
Civil Service Application	.04	.02
Public Employment Service	.04	.07

(Continued)

TABLE 19 (Continued)

	Statistic	
Variable	Job Stayers	Job changers (1975-76)
Private Employment Agency	.03	.03
Media	.08	.12
Relatives	.27	.15
Friends	.31	.35
Direct Application to Firm	.12	.14
Other	.05	.10
Number of Observations	971	768

SOURCE: Mathematica Policy Research, Inc.

With regard to the search method used to obtain the October 1976 job, there are several differences between workers who found their jobs before 1975 and those who started during calendar 1975-1976. The proportion using school/college placement services, civil service applications, and relatives declined substantially. The drop in school placement as an employment channel is reasonable because of the longer period since graduation for the recent job changers. The large drop in the use of relatives to find a job may be explained by two factors.

First, relatives may be most useful in "getting someone started", but thereafter, an individual becomes more self-sufficient as he or she becomes better acquainted with the labor market, and hence, does not have to rely as much on the family. Second, we conjecture that jobs found through relatives tend to be "good" jobs which young workers are reluctant to leave. Hence, the difference between the two subsamples may imply that recent job changers are less likely to have used relatives in the first place.

The public employment service becomes a more important source of jobs for the recently employed. This greater role may be explained partly by the work experience accumulated by job changers who may have been laid off, but who qualified for unemployment insurance and hence, were required to register with the local public employment agency. The greater reliance on media and the public employment service may reflect the fact that as workers become more integrated into the labor force, they are more cognizant, or able to take advantage of, formal market intermediaries. Contrarily, one can speculate that these mechanisms are used most frequently by unstable workers, or are most effective for occupations/industries in which mobile workers reside. Perhaps with better labor force experience data, these questions can be resolved. Finally, the rather obvious problem of small numbers of observations for some of the search methods should temper inferences drawn from the statistics in table 19 regarding sample differences.

3. Interpretation of Empirical Results

The regression results for the two samples, job stayers and job changers, are presented in table 20. The purpose of this sample stratification is to determine how the impact of search methods on the percentage change in wage rates (October 1974 to October 1976) varies by job stability. The search method variables denote how respondents found their October 1976 job. Thus, for job stayers, the analysis estimates either a lagged effect or time-persistent effect of search methods used before the 1974-76 time period. For job changers, the analysis measures the short-run wage effects of the methods reported to have been used to obtain the end-period job, vis-a-vis the wage rate earned on the beginning-period job. Analyzing job stayers separately also enables us to estimate how the effects of other explanatory variables on 1974-76 wage change vary by an individual's labor mobility.

The wage change equation is actually estimated by regressing the log of the October 1976 wage rate, log(W-76) against a set of explanatory variables, including log (W-74). This respecification retains the change model specified in chapter VI while permitting the log(W-74) coefficient to vary from unity. The estimated coefficients on log(W-74) for both samples are considerably less than one, suggesting a general compression in the distribution of wage rates: a convergence to the mean value. This phenomenon is stronger for job changers, which is reasonable given that they are more likely to experience greater wage change than those who remain with the same employer throughout the two-year period. This regression to the mean, however, may also be a statistical artifact since transitory elements and measurement errors contained in reported wage rates will tend to offset one another over time.

Race/Sex identity is estimated to be significantly associated with wage change. For immobile workers, black males fared significantly better than white males (by 5 percent); while females, regardless of race, experienced about a 7 percent smaller change in hourly earnings. For job changers, only white females differed significantly from the omitted group of white males, and they encountered a relatively sharp reduction in wage rates of 18 percent. This suggest either that job stability is particularly important in the occupations/industries in which white females tend to work (e.g., rapid salary increases on the basis of tenure), or that this subset differs significantly in ways that are unobserved in our analysis.

The estimation found that a young person's socioeconomic background did not have a significant influence on wage growth. Nor did the high school program have a significant impact. An individual's aptitude, however, does have a significant positive effect for job stayers, and a positive though marginally insignificant influence on wage change for mobile workers.

Aptitude is believed to be related to a worker's productivity and the rate at which skills are learned while on the job. To the extent that employers recognize and reward employees with better skills, we expect workers with higher aptitudes to experience greater wage growth than comparable workers with lower aptitudes. This finding also suggests that firms base their promotion and wage decisions on more than just formal educational attainment, an argument that is put forth by advocates of the "screening" and the "sheepskin" hypotheses. In brief, the screening hypothesis posits that employers use educational attainment as a signal of an individual's innate skills and social habits, and that education per se does not have much effect on skill development. Hence, employers use years of schooling as a signal in making their hiring and promotion decisions because in the absence of adequate information, such an indicator provides a useful screening device with which to identify desirable employees. The sheepskin argument is analagous in that degrees are considered to be crucial milestones and that a difference in one year of schooling has a disproportional effect on labor market success if it is associated with earning a degree.

Our analysis does not provide a test of whether or not firms hire workers in a manner consistent with the screening or sheepskin hypotheses. The evidence for the NCES samples, however, implies that employers are, or become cognizant of, worker skill differentials and subsequently provide remuneration reflecting skill differences. The asymetrical effect of aptitude for our two samples is expected in the above context: employers are more likely to observe productivity differences among job stayers than they are among their most recent workers.

Postsecondary education is expected to be associated with higher wage rates because additional schooling presumably adds to a person's stock of human capital. To the extent that such increments are of marketable value (i.e., affect a worker's productivity), workers who acquire such training should command a hgher wage rate than in its absence. The measures used for postsecondary education (PSE), however, are crude and the results should be interpreted with caution. First, a distinction should be made between PSE degrees earned before and during the analysis period. If PSE has a positive, but once-only effect on wage rates, then a wage change specification such as ours may yield inaccurate estimates of the return to PSE if most of the observed training occurred before October 1974. Second, attendance, length of stay, and type of program may influence the return to

PSE programs. Third, there may be systematic, but unobserved differences between those who enroll and earn PSE degrees and those who do not. Without controlling for this sample selectivity, estimates of the pecuniary effects must be considered tentative.

Our purpose in including PSE degrees, however, is not to analyze the returns to post-high school education. Rather, it is to control for the possible influence of this form of human investment in order to obtain estimates of the impact of migration on wage rates. With the foregoing caveats in mind, the results do indicate a generally positive return to PSE degree attainment for job stayers, but not for job movers. For the former group, earning either a voc-ed degree, "other" certificate or degree, or a license is associated with greater wage growth. While the dates of degree awards are not controlled for, it is probably the case that they pre-date the analysis period and the positive returns reflect either a lagged effect or a time-persistent effect.

The lack of a significant PSE wage influence for job changers suggests an interesting interpretation that reinforces the discussion regarding the role of aptitude in a wage growth model. That is, the acquisition and development of skills appears to pay off only when combined with on-the-job experience. Job instability interupts this cumulative effect in that employer recognition and reward for worker skills appears to be dependent on job tenure - firms require time to observe and assess worker productivity, a condition that tends to be unfulfilled for job changers. To the extent that this argument is valid, then our results offer an explanation of why job changers, on average, are estimated to suffer relative wage losses compared to job stayers. In chapter VI, this negative effect was found to be most pronounced for the most recent job switchers, which is consistent with the above discussion. By splitting the sample on the basis of job stability, we have found a reasonable explanation of why job changers experience relative, short-run wage losses, apart from an inefficient search or job selection process.

The number of weeks employed may affect wage growth insofar as on-the-job experience is associated with increments to work skills. Past (October 1973 to October 1974) and current (October 1974 to October 1976) employment experience are estimated to have significant and positive effects on wage growth for job changers. Note that while the respective coefficients differ by a factor of two, this difference is due primarily to the fact that the current period is twice as long as the past period, not because of a disparity in that marginal effects on wage change (the standardized, beta coefficients are .10 and .075, respectively).

These estimates suggest that workers with little employment experience encounter difficulties in securing a better-paying job than otherwise similar workers with relatively more experience. This makes sense in that potential employers are likely to weigh a job candidate's work experience in the hiring decision and in setting the entry wage rate. In addition, the current employment experience variable may also be picking-up the effect of unemployment. If a longer jobless period either makes a job searcher less attractive to a firm, or makes a job seeker less selective in accepting a job offer, then we would expect current weeks of employment to have a positive impact on wage change.

The work experience variables, however, do not have a similar impact for job stayers. Past experience has an insignificant effect which may be caused by its lack of distinction between weeks of employment for one employer versus two or more employers. In contrast, the weeks of employment during the two-year analysis period is negatively related to wage growth for job stayers. While at first blush this relationship may seem contradictory, it does coincide with our a priori expectations.

Recall the development of the change model in equation (4) of chapter VI. Initially, the wage level equations were specified as a function of experience and experience-squared in order to capture the curvilinear relationship between wage rates and experience. That is, the positive effect of experience on wages begins to diminish over time, eventually beginning to decline. In terms of a wage level equation, this implies a positive coefficient on experience and a negative coefficient on experience-squared. However, in a wage change equation, the quadratic term drops out, but the coefficient on experience now measures the quadratic effect of experience (deflated by a factor of 4).

Hence, the negative coefficient estimated on weeks of employment (divided by 4), is an estimate of how the wage rate-experience effect is adjusted downward with the accumulation of work experience. The curvilinear relationship, of course, cannot be determined without running a wage level equation to obtain the coefficient of the linear experience variable. This argument cannot be applied to the job changer sample because we are unable to assign weeks of employment to any one employer, nor do we have an initial wage rate for mobile workers on their new jobs (the time frame may also be too short for the most recent job switchers).

The roles of job and location mobility were discussed in the previous chapter. Common to the two samples analyzed in this chapter, is that migration during the 1972-74 period continues to be associated with greater wage growth for both job stayers and job movers, with and without controlling for the size of the community in which a respondent resided as of October 1976. This evidence implies that migrants are able to geographically position themselves in labor markets offering greater wage growth potential, in general, and/or are able to locate better worker-firm matches which result in a more favorable wage performance than for otherwise similar nonmigrants.

The community size in which a respondent lived in October 1976 is intended to control for differential rates of overall wage growth particular to the size of the local labor market. Because the use of search methods to obtain the October 1976 job may be correlated with city size, excluding the latter from the estimation would lead to misleading estimates of the wage impacts of search methods. The results imply a strong positive association between the size of community and wage change. The larger coefficients for the job changer sample reflect either (1) a movement from smaller to larger localities, a pattern discussed in chapter VI, or that (2) job switchers in larger communities are more likely to find a better-paying job than if they had switched in a smaller-sized area.

The gross returns estimated for the various search methods used to find the October 1976 job do not display much variation from one another, or from the omitted category (direct application to employers). With regard to workers who have held the same job for at least two years, the channel of employment does not appear to affect subsequent wage growth, although it may have had an immediate impact. With respect to recent job changers, the regression analysis does reveal some short-run differences.

Workers using a public employment service to find a job experience smaller wage increases, and those who used friends are estimated to have significantly greater wage gains relative to the omitted category. In some cases, there are so few sample observations that reliable coefficient estimates are probably unobtainable, even if a systematic relationship existed in the population at large (these methods are school/college placement, civil service applications, and private employment agencies, all of which have positive but insignificant coefficients).

The relatively poor wage growth associated with public employment placement services, *ceteris paribus*, tends to confirm its generally negative reputation regarding the quality of jobs accessible to its job applicants. While this is not necessarily a criticism of the public employment service itself, it may imply that the range and type of employment positions that it covers is somewhat limited. A more encompassing job bank, in this sense, would probably lead to better market outcomes for workers who choose or who have little choice but to use the publicly provided placement service. Another alternative explanation for its negative wage association may be that workers who rely on the public employment service were laid off (they must register with the service to qualify for unemployment compensation), and if laid-off workers tend to experience greater obstacles than job quitters, then the negative return that is estimated may be spurious because there is no variable available in the data with which to control for the cause of a recent job termination.

The positive return associated with using friends to find a job suggests an interesting interpretation. Informal methods such as friends and relatives are considered to provide relatively in-depth information

TABLE 20

REGRESSION COEFFICIENTS ON THE OCTOBER 1974 TO OCTOBER 1976 PERCENTAGE CHANGE IN WAGE RATES: SEARCH METHODS ANALYSIS

(absolute value of t ratios in parentheses)

Variable	Job Stayers		Job Changers	
Log (W-74)	.587	(22.78)***	.351	(9.89)***
Nonwhite Male (99,91)[a]	.054	(1.67)*	-.052	(1.21)
Nonwhite Female (99,67)	-.072	(2.12)**	-.063	(1.20)
White Female (356,283)	-.067	(3.16)***	-.181	(5.96)***
General/Academic HS Program (621,516)	.002	(0.08)	.010	(0.37)
Socioeconomic Status of Parents	.007	(0.40)	-.009	(0.43)
Aptitude Score	.006	(3.83)***	.003	(1.48)
Earned Certificate (149,130)	.020	(0.82)	.024	(0.72)
Earned License (65,50)	.055	(1.62)	.076	(1.51)
Earned Voced Degree (36,35)	.081	(1.74)*	-.062	(1.04)
Earned Jr. College Degree (30,35)	.045	(0.91)*	-.058	(0.98)
Earned Other Cert/Degree (29,20)	.116	(2.31)**	-.006	(0.07)
No. Weeks Employed: 10/73-10/74	.001	(0.94)	.003	(3.04)***
No. Weeks. Employed: 10/74-10/76	-.001	(1.65)*	.001	(2.23)**
Search Method Used to Obtain 10/76 Job				
School Placement Services (89,14)	.000	(0.01)	.020	(0.21)
Civil Service Application (41,17)	-.057	(1.35)	.058	(0.67)
Public Employment Service (37,53)	-.020	(0.44)	-.093	(1.81)*
Private Employment Agency (26,22)	-.047	(0.88)	.073	(0.95)
Media Newspaper, TV, Radio (74,94)	-.011	(0.36)	-.063	(1.53)
Relatives (264,113)	.007	(0.34)	-.002	(0.06)
Friends (298,265)	-.004	(0.20)	.049	(1.64)*
Other (50,79)	.027	(0.68)	.007	(1.00)
Small City - 1976 (253,176)	.024	(0.96)	.043	(1.15)
Medium Metro - 7976 (191,143)	.043	(1.56)	.092	(2.79)**
Large Metro - 1976 (210,161)	.070	(2.57)**	.105	(2.66)***
Very Large Metro - 1976 (128,137)	.071	(2.26)**	.111	(2.70)***
Lambda	-.001	(0.02)	.067	(1.00)

(Continued)

TABLE 20 (Continued)

Variable	Job Stayers	Job Changers
Started 10/76 Job in 1976 (492)		-.048 (1.82)*
Location Change: only in 1972-74 (100)		.072 (1.91)*
Location Change: 1974-76 (81)		.144 (3.55)***
Constant Term	.496	.486
R^2	.473	.282
F Statistic for the Equation	30.222***	9.643***
N	971	768

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a: Dummy variables are followed by the number of observations in parentheses for the two samples, respectively.

*: 10% level of significance, two-tailed test.

**: 5% level of significance, two-tailed test.

***: 1% level of significance, two-tailed test.

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(qualifications required, renumeration, job characteristics) for relatively few jobs. The opposite is believed to typify formal search methods. Hence, our results imply that access to better information, coupled with the likelihood of personal recommendations, leads to a more favorable outcome.

D. CONCLUDING REMARKS

Young high school graduates rely most heavily on informal search methods to look for and obtain employment. In particular, direct application to firms, and use of friends and relatives are cited most frequently by all race/sex groups in the NCES sample. While formal methods tend to be used much less than informal methods, school/college placement, private employment agencies, and union registration account for a considerably greater proportion of job matches relative to their use rates, than do other formal and informal methods. This suggests that these institutions play important roles as labor market intermediaries.

In contrast, direct firm contacts, and especially the use of media and public employment services have relatively lower effectiveness rates compared to their respective use rates. This may imply that direct applications and responses to advertisements provide little job requirement and worker skill information to potential employers and employees, thereby reducing the odds that any one contact will result in an acceptable offer. This seems to be particularly true for the use of media as a job search method. The lower effectiveness rate for public employment agencies may reflect either the relatively limited number/type of job vacancies listed with the agency, or the fact that laid-off workers register with the agency only as a prerequisite for receiving unemployment insurance and hence, use it only in a nominal sense.

The estimated returns to search methods used to find the October 1976 job provide some additional information. For those who obtained their jobs through the public employment service, the percentage change in wage rates was significantly lower than for workers who used other methods. Thus, the public employment service appears to be both a less effective source of jobs and, for the workers who are placed, the relative wage payoff is smaller. However, it is premature to conclude that the public employment service is not a cost-effective intermediary because it may enable job seekers to obtain employment without investing much time or money into the job hunt. Hence, the time commitment required of seeking out job vacancies, via direct employer contacts, and possibly by responding to want-ads, may offset much of the differential between these methods and the public employment service.

The only search method with a significantly positive wage effect is the use of friends. As discussed earlier, the more detailed information provided to workers, and possibly the use of friends as references, contributes to a greater chance of obtaining a better paying job. This finding suggests that both workers and firms would benefit from the provision of richer, more accurate data on one another.

The lack of significant variation across most search methods is somewhat surprising. Part of this is due to the insufficient number of persons in the job changer sample who reported using some of the methods (school placement, civil service, and private employment agencies).

Another explanation, one that is difficult to disentangle, is that job-seekers tend to use a variety of methods (the average number is four) when looking for a job. During the job hunt, however, the individual may find that because of personal skills/preferences or the characteristics of the job market, certain methods seem to be the most useful in generating information and offers. Hence, there may be a self-selection phenomenon taking place whereby searchers gradually eliminate unproductive methods and focus their time/money investments into only one or two. One could speculate that the outcome of this winnowing-out process, ceteris paribus, is that there is a general bunching of the respective wage impacts associated with the methods that are oberserved to result in a job find.

Our results imply that search methods seem to influence the starting rate of pay, but thereafter, other attributes of the worker, or well as the firm and local labor market, dominate in the wage growth process. Specifically, the sample stratification has enabled us to isolate what may be a major explanation of why interfirm mobility results in a short term depression in wage rates. The human capital literature makes the distinction between productive skills applicable to all jobs (general) and skills that are relavant only to a particular firm (specific). If employers pay their workers according to their general skills, and in addition pay them a portion of their firm-specific capital in order to reduce voluntary turnover, then switching jobs should result in a wage reduction until firm-specific skills are acquired on the new job.

In this context, our results indicate that a worker's value to a firm is not only a function of on-the-job experience, but is also dependent on other characteristics such as aptitude and postsecondary education.

These attributes affect both the level and rate of skill development which in turn is reflected in greater wage growth. To the extent that the link between skill development and wage change requires employer recognition, then we would expect this relationship to be most pronounced for stable workers - a result that is corroborated by our results. However, the limited time frame of the NCES data do not permit generalizing these findings to this cohort as they gain more labor force experience. It is possible that over time, educational attainment and aptitude may play a smaller role in determining labor market successes, and interim work experience may play a more influential role.

In sum, the search method analysis should be considered exploratory. It has provided useful information on the primary channels of employment and has identified two methods that seem to have relatively large and small wage payoffs. However, the analysis is limited by its narrow examination of the job search process, and therefore, raises as many questions as it answers. For example, to evaluate the returns to various search methods requires data on the time and money invested per method, or how frequently a method was used. Nor do we have sufficient information to discern systematic patterns of usage among methods, if any exist. And finally, the employment and wage implications of search are governed in part by the nature of a recent job separation and in part by prevailing labor market conditions, neither of which are available in the data.

APPENDIX A

A REVIEW OF STATISTICAL METHODS FOR THE ANALYSIS OF QUALITATIVE CHOICE DATA

It is clear from the text that some of the analysis in this study involves analyzing the factors that lead respondents to make a certain choice from among alternatives; e.g., whether to mightrate or stay in one location. Such a choice is represented by a dichotomous variable which takes a value of unity if one of the alternatives is chosen, and zero if the other is chosen.

The usual method of analyzing the effect of given explanatory variables on a dependent variable is *multiple regression analysis,*[1] which is based on, among other things, the assumption that the dependent variable is normally distributed. This assumes that the observed dependent variable, as well as its predicted value, can take any value along the real line. Clearly, this cannot be the case where a dichotomous dependent variable is involved, since it can only take a value of zero or one. Furthermore, its predicted value (i.e., the probability that the variable takes a value of one) necessarily falls in the interval between zero and one.

There are two major classes of models that are commonly used for the multivirate analysis of qualitative choice, namely *probit* models and *logit* models.[2] What they have in common is that they preserve the very attractive linearity property of the multiple regression model by assuming that a transformation of the probability of an event's occurence is a linear function of the explanatory variables, while assuring that the a priori restriction that the probability lies in the unit interval is observed. Specifically, the (dichotomous) probit model is of the form

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[1] For instance, see Theil (1971).

[2] A standard reference for the fundamentals of probit analysis is Finney (1952). A standard reference for the basics of logit analysis is Cox (1970).

$$\Pr(y_t = 1) = \int_{-\infty}^{z_t} (2\pi)^{-\frac{1}{2}} \exp(-\tfrac{1}{2}w^2)\, dw. \qquad \text{(A1)}$$

where $B_t = \sum_j Kj\, X\, jt$, while the (dichotomous) logit model[1] is of the form

$$\Pr(y_t = 1) = (1 + \exp \{ - \bar{z}_t \}]. \qquad \text{(A2)}$$

Essentially, equation (A1) describes a cumulative normal curve, whereas equation (A2) describes a cumulative logistic curve. It is a well-known fact that those two functions are very similar[2]; in fact, both describes S-shaped curves of the form shown in Figure A.1. How, then, does one decide between the use of the two classes of models? There is one practical consideration which has led us to opt for the use of logit models; namely, the fact that equation (A1) can only be evaluated numerically; hence, it would be rather tedious to generate predicted response probabilities for given values of the explanatory variables, whereas

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[1] The generalization of this model to the case of choice from among several alternatives (the so-called multinomial logit model is straight forward.

[2] For instance, see Cox (1970, pp. 26-69).

In the logit model, it is straightforward to perform certain tests of hypotheses, just as it is in the linear model. Suppose the analyst wishes to know whether a given explanatory variable has an effect on the probability of an event (say, migration). This effect is represented by the estimated coefficient of that variable. Since the ratio of the estimated coefficient to its standard error has an asymptotic standard normal distribution, a standard test can be performed (at least for large samples). A joint test on several coefficients can be performed by estimating the model with the several coefficients constrained (say, to be equal). If L_o is the log of the likelihood function associated with this model, and L_1 is the log likelihood associated with the unrestricted model, then:

$$X^2 = 2(L_1 - L_o) \qquad (A3)$$

has an asymptotic chi-square distribution under the null hypothesis represented by the restricted model.

The partial derivative of the probability that the ith person will choose an alternative with respect to the jth independent variable is given by

$$\frac{\partial pz}{\partial Xji} = Bj\ pi\ (1 - pi\ (1 - pi). \qquad (A4)$$

We should not conclude this discussion without acknowledging an objection to the logit model that has been articulated. A number of researchers have examined the behavioral theory that underlies commonly used quantal choice models.[1] They have found that some very peculiar, and often unrealistic, behavioral assumptions are required to order to derive models such as (A2). In particular, one must assume that the relative probabilities of choosing two alternatives are independent of the presence of absence of other alternatives. The problem with this assumption is best illustrated by the following example, due to Hausman and Wise (1978). Assume that initially the probability that a respondent will drive to work is two-thirds, with a one-third probability that he/she will take a (red) bus. Then assume that the option of taking a blue bus presents itself. According to the behavioral theory underlying (A2), the probabilities of driving, taking the red bus, and taking the blue bus are one-half, one-fourth, and one-fourth, respectively, whereas a more plausible scenario would hold that the probability of driving should be unaffected, that the blue bus would only attract persons who used to take the red bus.

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[1] See especially McFadden (1976, 1978) and the literature cited therein.

In order to correct for this problem, a number of generalizations of the multinominal probit and logit models have been proposed. For instance, McFadden (1978) suggests the use of a "hested logit" model, which involves the stepwise application of two or more multinomial logit models. We concluded that the use of such models is not warranted in the research reported here for the following reasons:

- Such procedures would be very costly and an unwise use of research resources.
- In our study there is no situation analogous to the introduction of the blue bus in the example given above. The alternative as we have defined then are clearly mutually exclusive from a logical standpoint (e.g., to move or not to move), and hence questions arising from the introduction of new alternatives based on new technology simply do not arise.
- A somewhat related point is that the researcher can avoid the problem by defining his/her dependent variables in an intelli-

gent manner; e.g., in the example given above, defining the generic alternative of "taking the bus," instead of treating the use of red and blue buses as distinct choices.

APPENDIX B

CONTROLLING FOR SAMPLE SELECTION EFFECTS

In the usual linear regression model,

$$Y_i = \sum_j X\ ij\ Bj + E_i, \tag{C1}$$

where Y is the value of the dependent variable for the i-th observation, x_{ij} is the correspondening observed value of the j-th independent variable, bj is the corresponding coefficient, and e_i is the error term. In such a model, it is easily shown that

$$E(y_i) = \sum_j X\ ijBj \tag{C2}$$

given the usual assumptions about the nature of the error term (i.e., that it is normally distributed with a zero mean, and that it is uncorrelated with the independent variables). It is also easily shown that the ordinary least squares (OL5) estimator of Bj, which we denoted here by bj, is unbiased and consistent.

When an observation is included in the sample only if the value of some variable Yzi is in a given range, then equation (Cz) does not necessarilyhold. Instead, as Heckman (1979) has shown,

$$E(y_i | \text{inclusion} = \sum_{\delta} X\ ijBj + \delta\lambda i, \tag{3}$$

where λ is a function of the probability that an observation is included in the sample and δ is the associated consistent coefficient. Estimation of all coefficients of the model can be accomplished by including a consistent estimator of λi, denoted here by $\hat{\lambda} i$, as an additional regressor in the model, using a procedure that we now describe.

The first step is to estimate the probability of inclusion in the sample. If one assumes that the value of Yzi is determined by a linear model similar to (C1), then one can define a variable dzi that takes a value of one if the observation is included in the sample, and zero otherwise.[1] Then a probit model can be used to estimate the probability that dzi = 1; that is,[2]

$$\hat{F}(B_j) = \int^{B_j} \hat{f}(Wi)\, dw_i \qquad (C4)$$

where

$$\hat{f}(W_i) = (z\Pi)^{-\frac{1}{2}} \exp(-\tfrac{1}{2} W = ^{z}) \qquad (C5)$$

$$Bi = \sum_{k} X\, ik\, C_k. \qquad (C6)$$

In equation (C6), Xi_k is the value of the k-th independent variable[3] in the probit model, and C_k is the associated estimated coefficient. Then

$$\hat{\lambda} i = \hat{f}(Bi) \,|\, \hat{F}(Bi) \qquad (C7)$$

is included as an independent variable in equation (A4).

Although this procedure yields consistent estimates of the Bjs and δ, the associated standard errors are in general not consistent, making usual hypothesis tests invalid. The cause of this problem is heteroscedasticity of the error terms in the model represented by equation (C4). This problem can be corrected by the application of weighted least squares (WLS), a method that is treated in any good econometrics text (e.g., Theil (1971), Chapter 6). Consistent standard errors can be obtained by estimating the coefficients of (C4) using OLS, and then constructing an estimate of the variance of the error term for the i-th observation by

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[1] In most applications of practical interest, only d_{zi} is observed, not the underlying variable.

[2] The integral given in (C5) must be evaluated using a numerical approximation formula. We are indebted to Steven C. Myers for supplying such a formula.

[3] The set of independent variables included in the probit model is generally different from that included in the linear model (C1), although there are usually some variables common to both.

$$\hat{\omega}_i^2 = \hat{\sigma}^2 - \hat{\delta}\hat{\lambda}_i(\hat{\lambda}_i + B_i), \qquad (C8)$$

where

$$\hat{r} = N^{-1} \sum_i [U_i^2 - \hat{\delta}^2 (\hat{\lambda}_i B_i - \hat{\lambda}_i^2)] \qquad (C9)$$

and where $\hat{\delta}$ is the OLS estimator of δ, and U_i is the OLS residual for the i-th observation. Then (C8) can be used to re-estimate the coefficients of (C3) by WLS, yielding consistent standard errors as well as consistent point estimates of the coefficients.

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